

NIKON Df

THE EXPANDED GUIDE



Jon Sparks



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« PAGE 2

The Nikon Df is currently one of the best-performing cameras, in any format, for shooting in low light.

» CONTENTS

Chapter 1	Overview	6
Chapter 2	Functions	26
Chapter 3	Menus	98
Chapter 4	Flash	144
Chapter 5	Close-up	170
Chapter 6	Lenses	182
Chapter 7	Accessories	206
Chapter 8	Camera Care	216
Chapter 9	Connection	222
	Glossary	234
	Useful web sites	237
	Index	238

The Nikon Df takes a unique place in the company's product range, and one that's unusually hard to define. It certainly stands apart from Nikon's other DSLRs in terms of design. Aesthetically, it consciously and deliberately harks back to classic 35mm Nikon cameras such as the FM2 and F3. In functional terms it also embodies some unusual elements, from the use of physical control dials for major settings to the absence—unlike all other current Nikon DSLRs—of a video mode.

» EVOLUTION OF THE NIKON DF

Among the major camera makers, Nikon has always been noted for its blend of continuity and innovation. When the main manufacturers introduced their first viable autofocus 35mm cameras in the 1980s, most of them jettisoned their existing lens mounts. However, Nikon stayed true to its

NIKON DF



tried-and-tested F-mount system and as a result, it's still possible to use the vast majority of classic Nikon lenses with the company's latest digital cameras, such as the D800 (although some camera functions may be lost). The Df extends this, having been engineered so that you can use virtually every Nikon lens ever made.

Nikon's first recognizable DSLRs were the 1.3 megapixel E2/E2s, which appeared in 1995. They had no rear LCD screen and images could only be viewed by connecting them to an external device.

At this time, Nikon's 35mm SLR range still included the F3 and FM2, which along with the FA contributed most of the design cues to the Df. It's perhaps worth reminding ourselves that all of these 35mm cameras were manual focus only. The FM2 was also manual exposure only, while the F3 offered Aperture Priority.

Although it had a shorter lifespan (1983–1987), the FA was an important and



innovative camera. Most significantly, it pioneered matrix metering, as well as offering Shutter Priority and Program exposure modes.

A rare variant of the F3, dubbed the F3AF, appeared in 1983. This was one of the first autofocus SLRs, but at the time only two AF lenses (80mm and 200mm primes) were available.

Three years later, a more popular AF model arrived in the form of the F501 (badged N2020 in North America). Nikon's first professional autofocus SLR was the F4, which appeared in 1988 and remained in production until 1997, when it was supplanted by the F5.

It's interesting to note that both the FM2 and F3 outlived the F4: the FM2 was produced, with only minor changes, from

NIKON FM2 AND NIKON DF

The Df is Nikon's lightest full-frame DSLR, but it is significantly larger than the 35mm Nikon SLRs (such as the FM2 shown here) from which it takes its stylistic lead.

1982–2001, and the F3 from 1980–2001, making it Nikon's longest-lived SLR (a record that will surely never be broken).

Before moving on to the development of its DSLRs, we should acknowledge that Nikon may be the last company still producing 35mm SLRs. The F6, introduced in 2004, is still manufactured in limited numbers and although Canon's EOS 1v is also available, it is reported that no more will be made.

› Digital breakthrough

While Nikon has shown a rare commitment to the 35mm SLR, it has also been one of the key players in the development of the digital alternative. This was clearly seen in 1999, with the launch of the 2.7 megapixel Nikon D1. For press photographers especially, this was a game-changer, and it remains the most influential digital camera ever launched (with the arguable exception of the iPhone).

The D1 was the first DSLR to approach the flexibility and ease of handling of its 35mm predecessors. Its sensor adopted the DX format, which was used in every Nikon DSLR until the launch of the “full-frame” (FX format) D3 in 2007. Nikon has subsequently put a lot of its energy into

its full-frame DSLR line-up—leading to some grumbling from those who want a professionally specified DX format camera to follow the highly regarded D300/D300s.

The D700 used the same sensor as the D3, and shared many other internals too, in a much more compact and lighter form. The D3 was directly followed by the D3s, D3x, and then the D4. The D4s is the latest professional flagship model.

Recent years have also seen the advent of the D800 and D800E, with their eye-watering 36 megapixel sensors. The D600 and D610 have 24 megapixels and, until the Df came along, were Nikon’s smallest and lightest FX format cameras to date.



NIKON DF

As Nikon's smallest and lightest full-frame DSLR, the Df is well-suited to shooting in remote locations.

«



1980: NIKON FM2

Its specification may look primitive by today's standards, but the FM2 is simple, light, and verging on indestructible.



1999: NIKON D1

The D1 was a revolutionary camera, making digital photography a practical, everyday proposition for thousands of professionals, not to mention amateur "early adopters."



2007: NIKON D3

Nikon might have led the world with the D1, but it subsequently slipped behind Canon for a few years. However, it came blazing back with the D3, its first full-frame digital SLR.



2014: NIKON D4s

Nikon's current professional flagship DSLR, the D4s, uses the same 16-megapixel sensor as the Df. It also weighs almost twice as much, but can shoot at twice the rate.

1 » NIKON FX FORMAT SENSORS

The DX format sensor, measuring approximately 23.6 x 15.8mm, was used in every Nikon DSLR prior to the D3. The number of pixels squeezed into that tiny area rose from 2.7 million in the D1 to approximately 24 million in all current DX format models (D3200, D5300, and D7100).

The D3 was the first Nikon DSLR to adopt a full-frame sensor, which Nikon designates "FX." Measuring approximately 36 x 24mm, an FX sensor is almost exactly the same size as a 35mm film frame and more than doubles the area of the DX sensor. Crucially, each individual photosite (pixel) is larger: even the FX format D800's 36 million photosites occupy a larger area than those in the 24-million pixel DX format models.

The D4s, and the Df, have a seemingly modest 16.2 million pixels, but this means that the individual photosites are several

times larger than those found in most DSLRs, and absolutely huge compared to most compact cameras. These large photosites give the sensor the ability to capture images with exceptionally low noise, even at high ISO ratings: the cameras' maximum "standard" ISO is 12,800, but this can be extended all the way to ISO 204,800.

CMOS (Complementary Metal Oxide Semiconductor) sensors are now used across Nikon's DSLR range. Significantly cheaper to make and less power-hungry than CCD sensors, CMOS sensors were once considered inferior in the image quality they could produce, but extensive research and development has gone into making them suitable for critical use. The Df's CMOS sensor, with 16.2 million effective pixels, produces images at a native size of 4928 x 3280 pixels.

PIXEL PICKING

The camera makers (or, at least, their marketing departments) continue to trumpet the number of megapixels as a key selling point. It's often a lot harder, especially with compacts, to discover how large (or rather, how small) the sensor is, but the simple fact is that for most purposes, most cameras have far more pixels than they need.

For compact cameras in particular, this clearly comes at the expense of other aspects of image quality, and also to the detriment of speed and responsiveness, as the camera takes longer to process the large amounts of data. Images from the Df are more than acceptable for use up to a double-page spread in most magazines.

» ABOUT THE NIKON DF

Viewed from the front, the Df is strongly reminiscent of classic Nikon 35mm SLRs, such as the F3, FM2, and FA, although it is noticeably taller overall. The body is also deeper front-to-back and significantly heavier than these cameras, yet it is still the lightest full-frame DSLR Nikon has produced to date.

The top view also harks back to 35mm cameras, with physical dials for setting the exposure mode, shutter speed, ISO, and exposure compensation. The rear, however, is far more reminiscent of Nikon's DSLRs (particularly the D800), with a largely familiar array of control buttons arranged around a 3.2-inch (8cm) LCD panel. Both the screen and the pentaprism viewfinder give 100% image coverage.

Internally, the sensor is the same as that used in the Nikon D4s, with image processing performed by Nikon's EXPEED 3 system. The standard ISO range runs from ISO 100–12,800, with extensions all the way to ISO 204,800.

However, the focusing system, which is based on the Multi-CAM 4800 module with 39 focus points, is similar to that in the D610. The Df's maximum shooting speed of 5.5fps (frames per second) is marginally slower than the D610 (6fps) and, unsurprisingly, well behind the D4s (which can shoot at up to 11fps, and maintain that rate for longer).

Apart from aesthetics, the Df differs from all other current Nikon DSLRs in one very significant way: there's no video mode. Some may consider this a fatal flaw, but clearly its omission is a deliberate choice by Nikon and one that resonates strongly with the camera's guiding ethos of "Pure Photography." There are many photographers who will find this decision both brave and refreshing.

As with all Nikon SLRs, the Df is part of a vast system of lenses, accessories, and software. This book will guide you through all aspects of the camera's operation, and its relation to the system as a whole.

» MAIN FEATURES

Body

Dimensions (W x H x D):
5.6 x 4.3 x 2.6in. (143.5 x 110 x 66.5mm)
Weight: 1lb 9oz. (710g) with battery and
memory card

Sensor and processor

Sensor: 36 x 23.9mm FX format
RGB CMOS sensor
Effective resolution: Approx. 16.2
megapixels
Image processor: EXPEED 3
Self-cleaning function

Still image file types and sizes

JPEG/TIFF resolution (pixels):
FX (36x24) image area: 4928 x 3280 (L),
3696 x 2456 (M), 2464 x 1640 (S)
DX (24x16) image area: 3200 x 2128 (L),
2400 x 1592 (M), 1600 x 1064 (S)
JPEG compression: Fine (approx. 1:4),
Normal (approx. 1:8), Basic (approx. 1:16)
Raw resolution: 4928 x 3280 pixels
Raw format: .NEF (12- or 14-bit)

LCD monitor

Type: TFT LCD
Resolution: Approx. 921,000 pixels
Size: 3.2in./8.1cm diagonal
Live View available

Viewfinder

Pentaprism viewfinder with 100%
coverage and 0.7x magnification

Focus

Nikon Multi-CAM 4800 AF module with
39 autofocus points
Three focus modes: Single-servo AF
(AF-S); Continuous-servo AF (AF-C);
Manual focus (M)
Three AF-area modes: Single-point AF;
Dynamic-area AF (with options including
3D tracking); Auto-area AF
Rapid focus point selection and focus lock

Exposure

Exposure modes: Programmed auto with
flexible (P); Aperture Priority (A); Shutter
Priority (S); Manual (M)
Metering patterns: Matrix; Center-
weighted; Spot
Shutter speeds: 1/4000–30 sec.
ISO range: ISO 100–12,800, extendible to
ISO 50 (Lo) and ISO 204,800 (Hi)
Exposure compensation: ±3 stops in
 $\frac{1}{3}$ -stop increments
Automatic exposure bracketing: ±3 stops
in $\frac{1}{3}$ -stop increments

Drive modes

Drive modes: Single; Continuous;
Self timer
Continuous shooting: Max. 5.5fps (frames
per second)
Buffer: 100 frames (JPEG Fine, Large);
approx. 30 frames (Raw)

Flash

Built-in flash: No
Hotshoe: Yes (compatible with Nikon Speedlight flashes)
Sync speed: 1/200 sec.
Flash modes: Front curtain sync; Red-eye reduction; Slow sync; Red-eye reduction with slow sync; Rear curtain sync; Slow rear curtain sync; Auto FP High-Speed Sync
Flash exposure compensation: -3 to +1 stops in $\frac{1}{3}$ -stop increments

Software

Supplied with Nikon View NX2 (incorporates Nikon Transfer 2); compatible with Nikon Capture NX2 and many third-party imaging applications.

Memory card

Type: Secure Digital (SD up to 2GB; SDHC up to 32GB; SDXC 32GB+)

System back-up

Compatible with around 60 current and virtually all non-current Nikkor lenses (functionality varies with older lenses); SB-series flash units; Wireless Remote Control WR-1 and WR-R10; Wireless Mobile Adapter WU-1a; and many more Nikon system accessories.

Connectivity

Connectors for external microphone, USB, A/V, HDMI, and Nikon remote cords/wireless controllers/GPS units.

1

» FULL FEATURES & CAMERA LAYOUT

FRONT OF CAMERA



[1] Fn button

[2] Pv button

[3] Camera strap mount

[4] Sub-command dial

[5] Lens mount (with bodycap fitted)

[6] Viewfinder pentaprism

[7] Self-timer lamp

[8] Camera strap mount

[9] Flash sync terminal cover

[10] Lens-release button

BACK OF CAMERA

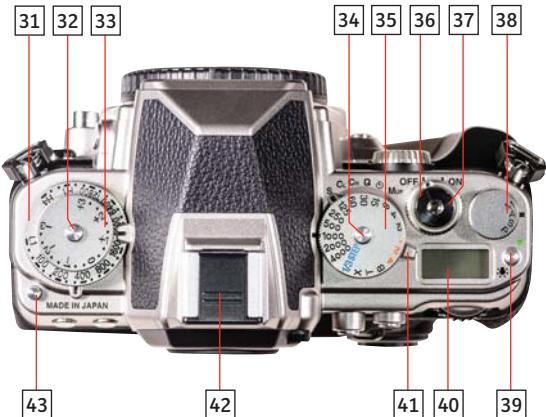


- [11] **i** button
- [12] Playback zoom out /
Two-button reset / Flash mode /
Flash compensation button
- [13] Playback zoom in /
Image quality/size button
- [14] Help / Protect / White balance button
- [15] MENU button
- [16] Image playback button
- [17] Delete button
- [18] LCD screen
- [19] Hotshoe

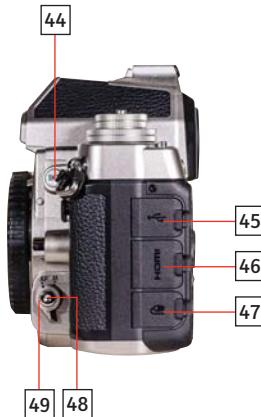
- [20] Viewfinder
- [21] Diopter adjustment wheel
- [22] AE/AF lock button
- [23] AF-on button
- [24] Main command dial
- [25] Metering selector
- [26] Multi-selector
- [27] OK button
- [28] Focus selector lock
- [29] INFO button
- [30] LV (Live View) button

1 » FULL FEATURES & CAMERA LAYOUT

TOP OF CAMERA

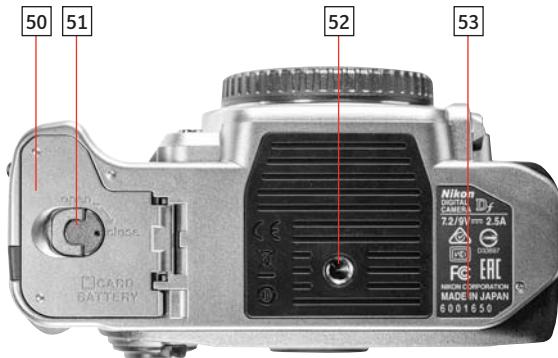


LEFT SIDE



- 31 ISO sensitivity dial
- 32 Exposure compensation dial lock release
- 33 Exposure compensation dial
- 34 Shutter speed dial lock release
- 35 Shutter speed dial
- 36 Power switch
- 38 Shutter-release button
- 37 Exposure mode dial
- 39 Control panel illuminator / Two-button reset
- 40 Control panel
- 41 Release mode dial
- 42 Hotshoe
- 43 ISO sensitivity dial lock release

- 44 Bracketing button
- 45 USB connector
- 46 HDMI mini-pin connector
- 47 Accessory terminal
- 48 AF mode button
- 49 Focus mode selector

BOTTOM OF CAMERA**RIGHT SIDE**

50 Battery / memory card compartment

51 Battery / memory card compartment
release lever

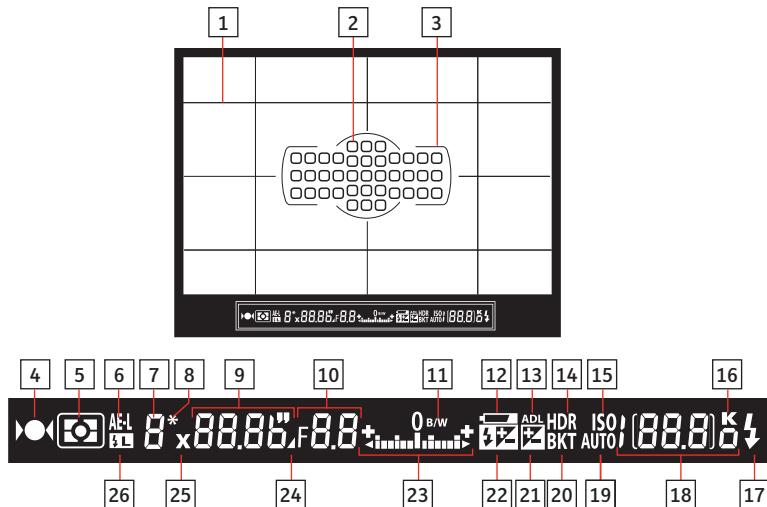
52 Tripod socket (1/4in.)

53 Camera serial number

54 Power connector cover

1

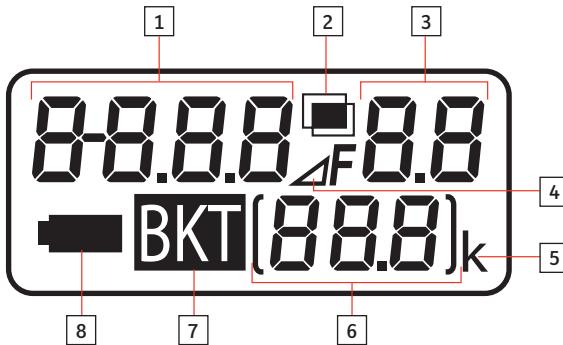
» VIEWFINDER DISPLAY



- [1] Framing grid
- [2] Focus points
- [3] AF area brackets
- [4] Focus indicator
- [5] Metering mode
- [6] Autoexposure (AE) lock
- [7] Exposure mode
- [8] Flexible program indicator
- [9] Shutter speed / AF mode
- [10] Aperture setting
- [11] Monochrome indicator
- [12] Low battery warning
- [13] Active D-Lighting indicator
- [14] HDR indicator
- [15] ISO sensitivity indicator

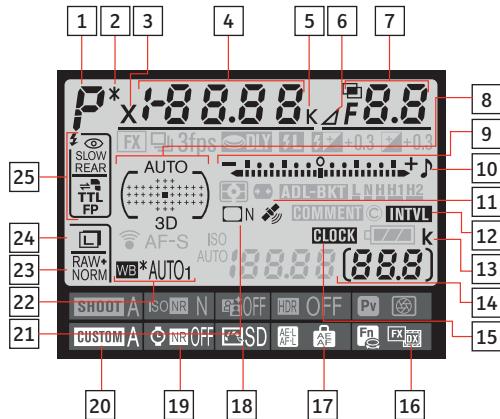
- [16] K (when over 1000 exposures remain)
- [17] Flash-ready indicator
- [18] Number of exposures remaining / Number of exposures remaining in buffer / White balance recording indicator / Exposure compensation value / Flash compensation value / ISO sensitivity / AF area mode indicator
- [19] Auto ISO indicator
- [20] Exposure / flash / WB / ADL bracketing indicator
- [21] Exposure compensation indicator
- [22] Flash compensation indicator
- [23] Exposure indicator
- [24] Aperture stop indicator
- [25] Flash sync indicator
- [26] FV lock indicator

» LCD CONTROL PANEL

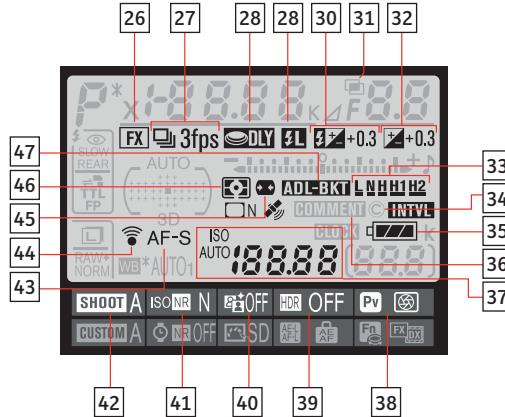


- | | |
|--|---|
| [1] Shutter speed / Interval timer
(number of intervals) | [6] Number of exposures remaining
Number of shots before buffer fills
Preset WB indicator / Capture mode
indicator |
| [2] Multiple exposure indicator | [7] Exposure / flash / WB / ADL
bracketing indicator |
| [3] Aperture / Interval timer
(number of shots for interval) /
PC mode indicator | [8] Battery indicator |
| [4] Aperture stop indicator | |
| [5] K (when over 1000 exposures remain) | |

1 » INFORMATION DISPLAY



- | | |
|---|--|
| [1] Exposure mode | [14] Number of exposures remaining |
| [2] Flexible program indicator | [15] "Clock not set" indicator |
| [3] Flash sync indicator | [16] Fn button function |
| [4] Shutter speed / Number of shots in bracketed sequence | [17] AE-L/AF-L button function |
| [5] Color temperature indicator | [18] Picture Control indicator |
| [6] Aperture stop indicator | [19] Long exposure noise reduction indicator |
| [7] Aperture setting / Bracketing increment | [20] Custom settings bank |
| [8] Focus point indicator | [21] Vignette control indicator |
| [9] Exposure indicator | [22] White balance / White balance fine tuning indicator |
| [10] "Beep" indicator | [23] Image quality |
| [11] Satellite signal indicator | [24] Image size |
| [12] Interval timer indicator | |
| [13] K (when over 1000 exposures remain) | |
| | [25] Flash mode |



[26] Image area indicator

[27] Release mode /
Continuous shooting speed

[28] Exposure delay mode

[29] FV lock indicator

[30] Flash compensation indicator

[31] Multiple exposure indicator

[32] Exposure compensation indicator

[33] Active D-Lighting bracketing amount

[34] Copyright information

[35] Battery status

[36] Image comment indicator

[37] ISO sensitivity indicator

[38] Pv button function

[39] HDR indicator

[40] Active D-Lighting indicator

[41] High ISO noise reduction indicator

[42] Shooting menu bank

[43] AF mode

[44] Eye-Fi connection indicator

[45] Auto distortion control

[46] Metering mode

[47] Exposure / flash / WB /
ADL bracketing indicator

PLAYBACK MENU		
Delete		
Playback folder	NCF	
Hide image		
Playback display options	--	
Image review	ON	
After delete		
Rotate tall	OFF	
Slide show	--	

Playback Menu

- › Delete
- › Playback folder
- › Hide image
- › Playback display options
- › Image review
- › After delete
- › Rotate tall
- › Slide show
- › DPOF print order

SHOOTING MENU		
Shooting menu bank	A	
Storage folder	102	
File naming	DFO	
Image quality	RAW	
Image size		
Image area	--	
JPEG compression		
NEF (RAW) recording	--	

Shooting Menu

- › Shooting menu bank
- › Storage folder
- › File naming
- › Image quality
- › Image size
- › Image area
- › JPEG compression
- › NEF (RAW) recording
- › White balance
- › Set Picture Control
- › Manage Picture Control
- › Color space
- › Active D-Lighting
- › HDR (high dynamic range)
- › Vignette control
- › Auto distortion control
- › Long exposure NR
- › High ISO NR
- › Auto ISO sensitivity control
- › Multiple exposure
- › Interval timer shooting



Custom Setting Menu

› Custom settings bank

a: Autofocus

- › a1 AF-C priority selection
- › a2 AF-S priority selection
- › a3 Focus tracking with lock-on
- › a4 AF activation
- › a5 Focus point illumination
- › a6 Focus point wrap-around
- › a7 Number of focus points

b: Metering/exposure

- › b1 Center-weighted area
- › b2 Fine tune optimal exposure

c: Timers/AE lock

- › c1 Shutter-release button AE-L
- › c2 Standby timer
- › c3 Self-timer
- › c4 Monitor off delay

d: Shooting/display

- › d1 Beep
- › d2 Viewfinder grid display

- › d3 ISO display
- › d4 Screen tips
- › d5 CL mode shooting speed
- › d6 Max continuous release
- › d7 File number sequence
- › d8 Information display
- › d9 LCD illumination
- › d10 Exposure delay mode

e: Bracketing/flash

- › e1 Flash sync speed
- › e2 Flash shutter speed
- › e3 Optional flash
- › e4 Exposure comp. for flash
- › e5 Modeling flash
- › e6 Auto bracketing set
- › e7 Auto bracketing (Mode M)
- › e8 Bracketing order

f: Controls

- › f1 button
- › f2 OK button
- › f3 Multi selector
- › f4 Assign Fn. button
- › f5 Assign preview button
- › f6 Assign **AE-L/AF-L** button
- › f7 Customize command dials
- › f8 Release button to use dial
- › f9 Slot empty release lock
- › f10 Reverse indicators
- › f11 Easy shutter-speed shift

SETUP MENU		
	Format memory card	--
	Monitor brightness	+1
	Auto info display	OFF
	Clean image sensor	--
	Lock mirror up for cleaning	--
	Image Dust Off ref photo	--
	Flicker reduction	AUTO
	Time zone and date	--

Setup Menu

- › Format memory card
- › Monitor brightness
- › Auto info display
- › Clean image sensor
- › Lock mirror up for cleaning
- › Image Dust Off ref photo
- › Flicker reduction
- › Time zone and date
- › Language
- › Auto image rotation
- › Image comment
- › Copyright information
- › Save/load settings
- › Virtual horizon
- › Non-CPU lens data
- › AF fine-tune
- › HDMI
- › Location data
- › Assign remote Fn button
- › Wireless mobile adapter
- › Eye-Fi upload
- › Firmware version

RETOUCH MENU		
	D-Lighting	
	Red-eye correction	
	Trim	
	Monochrome	
	Filter effects	
	Color balance	
	Image overlay	
	NEF (RAW) processing	

Retouch Menu

- › D-Lighting
- › Red-eye correction
- › Trim
- › Monochrome
- › Filter effects
- › Color balance
- › Image overlay
- › NEF (RAW) processing
- › Resize
- › Quick retouch
- › Straighten
- › Distortion control
- › Fisheye
- › Color outline
- › Color sketch
- › Perspective control
- › Miniature effect
- › Selective color
- › Side-by-side comparison



My Menu/Recent Settings

- › Add items
- › Remove items
- › Rank items
- › Choose tab

Much has been made of the way the Df draws on classic Nikon 35mm SLRs. Nowhere is this more obvious than in the use of physical control dials on the camera's top-plate for adjusting a number of key settings.

Anyone who cut their teeth on a Nikon FM2 or F3 will feel right at home with the Nikon Df, although photographers who have grown up with other contemporary DSLRs may find that they need a little time to acclimatize.

However, this is unmistakably a digital camera and the layout of the rear of the Df will be familiar to any regular user of Nikon's DSLRs. From this standpoint, the camera it most closely resembles is the D800, although the metering pattern selector is taken from Nikon's top pro models (specifically the D3 series).

In the final analysis the Df is something of a hybrid camera. It's possible to set the shutter speed using the main command dial—as you would on any other Nikon DSLR—but the other "35mm-style" controls cannot be bypassed: the only way to change the ISO setting is with the dial on the top-plate, for example. When older lenses with a physical aperture ring are fitted you can (if you wish) use this to set the aperture; on more modern lenses (G-type) you need to use the camera's sub-command dial.

Nikon clearly expects that users of the Df will have some previous photographic (and probably SLR/DSLR) experience. However, if you are new to DSLRs you can just pick up the camera and start shooting. Program mode will take care of the basics of exposure, while the white balance is set to Auto when you first unpack the camera. Perhaps the first control that you will need to tackle after this is the ISO setting, although you can engage Auto ISO sensitivity control in the Shooting menu.

In keeping with Nikon's other pro DSLR camera models, the Df does not have the comfort blanket of Auto and Scene modes, so sooner or later (probably sooner) it will be necessary to make some decisions of your own, such as setting the Image Quality or Picture Control.

Of course, that's what this book is for, and this chapter aims to provide you with a step-by-step introduction to its key features and functions. It would be impossible, even in a book twice the length, to fully explore every last detail, so we'll focus on the areas that will be most relevant to the majority of photographers.

» GETTING STARTED

It's tempting to start shooting right away when you unpack a new camera, and taking pictures is certainly the best way to learn. However, it still makes sense to peruse this book first and make sure you don't miss out on new features and functions.

Settings

- › Focal length: 12mm
- › Aperture: f/11
- › Shutter speed: 1/80 sec.
- › ISO: 100



When you first unpack the camera, there are several things to do before it's ready to shoot. Some, such as attaching the strap, may only need to be done once, but most—mounting the lens and inserting the battery and memory card, for example—are regular operations that soon become familiar. For professionals it can be crucial to perform them efficiently in awkward situations or when time is short.

› Attaching the strap

To attach the strap, make sure that the padded side faces inward (so the maker's name faces out). Attach one end to the appropriate eyelet, located at the top left

and top right sides of the camera. Loosen the strap where it runs through the buckle, and then pass the end of the strap through the eyelet and back through the buckle. Bring the end of the strap back through the buckle, under the first length of strap already threaded (see photo below). Repeat the operation on the other side.

Adjust the length as required, but leave a "tail" for security. When you are satisfied with the length, pull the strap firmly to tighten it. Slide up the sleeve to keep the "tail" tucked neatly away and repeat the entire operation on the other side.



ATTACHING THE STRAP

On the left of the picture the strap is shown threaded, but it has not yet been tightened.

«

› Adjusting for eyesight



THE DIOPTER ADJUSTMENT CONTROL

› Mounting lenses



MOUNTING A LENS

The Df offers dioptic adjustment of the viewfinder of between -3 and $+1\text{m}^{-1}$, to allow for individual variations in eyesight. Make sure this is optimized for your eyesight (wearing eyeglasses or contact lenses if you normally do so) before using the camera.

The diopter adjustment control is found to the right of the viewfinder. With the camera switched on, rotate this control until the markings on the focusing screen or the viewfinder display (such as the exposure readouts) appear sharpest. For most people this is a one-time operation.

Switch the camera off before changing lenses. Remove the rear lens cap and the camera bodycap (or the lens if one is already mounted).

To remove a lens, press the lens-release button and turn the lens clockwise (as you look at the front of the camera).

To attach a lens, align the index mark on the lens with the one on the camera body (white dot) and insert the lens gently into the camera. Turn the lens counter-clockwise until it clicks home. Do not use force: if the lens is correctly aligned it will mount smoothly.

**INSERTING A MEMORY CARD****Inserting and removing memory cards**

The Df uses Secure Digital (SD) cards, including high-capacity SDHC and SDXC cards. Unlike other Nikon DSLRs, the memory card slot is found under the same cover as the battery compartment, on the camera's baseplate.

Note:

Memory cards are cheap, but the images they carry may be irreplaceable. It is a good idea to keep spare cards in a case and avoid exposure to extremes of temperature, direct sunlight, liquids, and strong electromagnetic fields.

1) Switch off the camera and check that the green access lamp on the back of the camera (below the multi-selector) is off.

2) Lift and turn the latch on the card/battery compartment cover to open it. The card slot is toward the rear of the camera.

3) To remove a memory card, press the card gently into its slot; it will spring out slightly. Pull the card gently from its slot.

4) Insert an SD memory card into the slot, with its label side facing toward the rear of the camera and the rows of terminals along the card edge facing into the slot. Gently push the memory card into the slot, until it clicks home. The green access lamp will light briefly.

5) Close the card/battery compartment cover and lock it with the latch.

Formatting a memory card

It is always recommended to format a new memory card, or one that has been used in another camera, before using it with the Df. This is also the quickest way to erase existing images, but formatting needs to be done with caution—always check first that any images on the card have been saved elsewhere.



FORMATTING A MEMORY CARD



To format a memory card

- 1) Open the Setup menu, select **Format memory card**, and press **OK**.
- 2) A warning dialog appears. Select **Yes** and press **OK**.

› Powering your Df

The Df is supplied with an EN-EL14a li-ion rechargeable battery. It's a good idea to charge this fully before using the camera.

Inserting the battery

- 1) Switch off the camera and check that the green access lamp on the back of the camera (below the multi-selector) is off.
- 2) Lift and turn the latch on the card/battery compartment cover to open it.



INSERTING THE BATTERY



- 3) Release the latch to open the compartment. Insert the battery, contacts first, with the flat face facing toward the lens. Use the battery to nudge the gold-colored latch aside, and then slide the battery gently down until the latch locks into position. The green access lamp on the camera back illuminates briefly.

- 4) Close the card/battery compartment cover and lock it with the latch.
- 5) To remove the battery, switch off the camera and open the compartment cover. Press the orange latch to release the battery and pull it gently out of the compartment.

Charging the battery

Use the supplied MH-24 Charger to charge the battery. Remove the battery terminal cover (if attached) and insert the battery into the charger with the maker's name uppermost and the terminals facing the contacts on the charger. Press the battery gently (but firmly) into position. Plug the charger into a mains outlet. The Charge lamp blinks while the battery is charging, then shines steadily when charging is complete. A completely flat battery will take around 110 minutes to recharge fully.

Battery life

The EN-EL14a battery that the Df uses is not used in any other "pro" Nikon camera, but it is found in the "enthusiast" D5300. This choice of battery helps to make the Df Nikon's lightest full-frame SLR, while still delivering very good battery life.

Battery life depends on various factors and Nikon does not recommend use at temperatures below 32°F (0°C) or above 104°F (40°C). Other important factors that can reduce battery life include heavy use of the LCD screen, long standby timer and monitor-off delays, and continuous use of autofocus (as when tracking moving subjects). Extended shooting in Live View is particularly draining.

Under stringent (CIPA) test conditions the Df delivers around 950 shots from a fully charged battery. In normal use, if you avoid the draining factors noted above,

you may do much better—it's quite possible to double this figure.

The control panel and Information Display give an approximate indication of how much charge remains. A low battery icon appears in the viewfinder when it is approaching exhaustion and the control panel icon blinks when the battery is exhausted. For information on alternative power sources see chapter 7.

Tip

The battery charger can be used abroad (100–240v AC 50/60 Hz) with a commercially available travel plug adapter. Do not attach a voltage transformer as this may damage the battery charger.

» BASIC OPERATION

With the strap, lens, battery, and memory card in place, the Df is ready to shoot.

› Switching the camera on



POWER SWITCH AND SHUTTER-RELEASE BUTTON

The power switch, which forms a collar around the shutter-release button, has two self-explanatory positions: **OFF** and **ON**.

Tip

If the power switch is turned OFF while the camera is recording image(s), the camera will finish the process before deactivating.

› Operating the shutter

The shutter-release button operates in two stages. Pressing it lightly, until you feel initial resistance, activates the metering and focus functions. Half-pressure also clears the Information Display, menus, or image playback, making the Df instantly ready to shoot. Press the shutter-release button more firmly (but still smoothly) to take the picture.

› Top-plate controls

The essential photographic controls (all of which have direct equivalents on 35mm SLRs) are found on the Df's top-plate.

At the right side are the power switch and the shutter-release button, as well as the release mode dial, shutter speed dial, and exposure mode dial. There's also a small LCD control panel and a button to illuminate this when required.

At the left of the top-plate is the ISO sensitivity dial and, sitting on top of it, the exposure compensation dial. All of these will be covered in this chapter.

› Main rear controls

The rear of the Df has 11 buttons, some of which serve multiple functions. This is in addition to a multi-selector, metering mode selector, main command dial, and the main LCD screen. Again, these controls will be covered in this chapter.

› Camera information

The Df is unusual for a digital camera, in that you can read key settings—notably the shutter speed and ISO—directly from the top-plate dials, even when the camera is switched off. However, there's a great deal more information to be had from the control panel, viewfinder, and rear screen.

The control panel and viewfinder

Essential shooting information, including the shutter speed and aperture setting, is displayed on the LCD control panel at the top right side of the camera.

The readout at the bottom of the viewfinder displays similar information, plus some additional detail, such as showing the ISO change as you rotate the ISO dial. This makes it possible to change this setting with the camera to your eye.

The Information Display

All the information noted previously—and much more beside—can be viewed on the rear LCD screen by pressing **INFO**. The large display makes it easier to read the information. The Information Display can be particularly helpful when using a tripod.

Quick Settings

Key menu settings can also be changed directly from the Information Display screen: press **info** to highlight the entries at the bottom of the screen. Move through them with the multi-selector and press **OK** to enter the corresponding menu item.



QUICK SETTINGS

Using the Information Display on the main LCD screen to change settings.

› The command dials

The main command dial and sub-command dial are fundamental to the operation of the Df, although the function of the main command dial is partly usurped by the shutter speed dial. Both dials have additional functions when used in conjunction with other control buttons, but by default, when used on their own they operate as follows:

Main command dial

In Program mode (**P**), rotating the main command dial engages Flexible program, changing the combination of shutter speed and aperture. In Aperture Priority mode (**A**) it has no effect.

In Shutter Priority (**S**) or Manual mode (**M**) it is slightly more complicated: the main command dial can be used to select the shutter speed, but only if the shutter speed dial is set to **1/3 STEP**.



THE MAIN COMMAND DIAL

Sub-command dial

Rotating the sub-command dial in Aperture Priority (**A**) or Manual (**M**) mode selects the aperture. In Shutter Priority (**S**) or Program (**P**) mode it has no effect.



THE SUB-COMMAND DIAL



Buttons and command dials

The main command dial and sub-command dial have a range of functions when used in conjunction with some of the other buttons: hold down the button while rotating the dial to make a selection.

In addition, the **Pv** and **Fn** buttons on the front of the camera, and the **AE-L/AF-L** button on the rear, can be used in conjunction with the command dials. Different functions can be assigned to each of these button/dial combinations via the **Controls** option on the Custom Settings menu.

Principal uses of the command dials in conjunction with other buttons

Command dial	Other button	Function
Main	FLASH	Select the flash mode (see page 154).
Sub	FLASH	Select level of flash compensation (see page 156).
Main	⊕	Select Image quality (see page 69).
Sub	⊕	Select Image size (see page 72).
Main	WB	Select White balance setting (see page 73).
Sub	WB	Select White balance preset (see page 73).
Main	BKT	Set bracketing sequence (see page 56).
Sub	BKT	Set bracketing increment (see page 56).

› The multi-selector



THE MULTI-SELECTOR

The multi-selector, on the back of the camera, is an important part of the control system. Its primary uses are in scrolling

through images in playback, navigating the menus, and selecting the focus point.

The collar around the multi-selector has an L (Lock) position. When it is locked the multi-selector can still be used for playback and menu navigation, but the focus point cannot be moved. Unlock the multi-selector by moving the collar to the position marked with a white dot.

› Release mode

The release mode dial sits beneath the shutter speed dial on the top-plate. The release mode dial has six possible positions. To prevent accidental switching between release modes the dial has a lock button: depress this to allow the dial to rotate.



THE RELEASE MODE DIAL



RELEASE MODE OPTIONS

Setting	Description
S Single frame	The camera takes a single shot each time the shutter-release button is depressed fully.
CL Continuous Low speed	The camera fires continuously as long as the shutter-release button is depressed fully. The default frame rate is 3fps, but this can be varied from 1–5fps using Custom Setting d5.
CH Continuous High speed	The camera fires continuously at the maximum possible frame rate, as long as the shutter-release button is depressed fully.
Q Quiet mode	Shoot as normal, but there are no alert beeps and the mirror return after each shot is damped to provide a quieter release.
⌚ Self-timer	The shutter is released a set interval after the shutter-release button is depressed fully. Can be used to minimize camera shake and for self-portraits. The default interval is 10 secs , but 2 secs , 5 secs , or 20 secs can be set using Custom Setting c3.
Mup Mirror-up	The mirror is raised when the shutter-release button is depressed fully; press again to take the picture. Useful for minimizing any vibration caused by "mirror slap," but superseded in many circumstances by Live View mode.

Although the maximum shooting rate for all file formats is around 5.5fps, this rate is not always attainable. Any difficulty in focusing can slow things down, as can the use of slower shutter speeds. The speed of the memory card can also be a factor.

› The buffer

Images are initially held in the Df's internal memory ("buffer") before being written to the memory card. The maximum number of images that can be recorded in a continuous burst depends upon image quality and size, drive mode, card speed, and how much buffer space is available.

The figure for the number of burst frames possible at the current settings is shown in the viewfinder at bottom right when the shutter-release button is half pressed. This figure assumes Continuous High speed shooting, and is displayed even if another release mode is selected. If (0) appears, the buffer is full and the shutter

will be disabled until enough data has been transferred to the memory card to free up space.

This will normally only be an issue when you are shooting long continuous bursts in Continuous High speed release mode. Even then it is more likely to be noticed as a drop in speed to 1-2fps, rather than a complete stop: it is only on rare occasions that you may have to lift your finger from the shutter-release button and re-press it to resume shooting.

In theory it should be possible to shoot almost indefinitely with a setting of JPEG Small, but there is a burst limit of 100 frames written into the firmware.



BUFFER «
A generous buffer capacity is very welcome when shooting action sequences.

Tip

If continuous shooting speed is an issue—as it may be for sports and wildlife photography—look for memory cards with a high speed rating. Currently, the fastest cards have a write speed of around 90mb/second, but cards around half this speed are fine for most shooting with the Df.

The largest file sizes—and therefore the greatest challenge to the buffer—comes when shooting TIFFs.

» EXPOSURE MODES

While Nikon's "consumer" DSLRs have a wide range of Auto and Scene modes, professional models such as the D4 and Df have just four: Program (**P**), Shutter Priority (**S**), Aperture Priority (**A**), and Manual (**M**).

In Auto and Scene modes the camera controls the majority of settings. These go beyond basic shooting settings, such as shutter speed and aperture, to include options such as the release mode, whether or not flash can be used, and how the camera processes the shot.

Conversely, the four "core" modes found across the entire Nikon DSLR range give you complete freedom to make your own choices about these things. As you will see, the differences between the modes lie solely in how the shutter speed and aperture are controlled.

Setting the exposure mode

To set the exposure mode, lift and rotate the exposure mode dial until the initial letter of the desired mode (**P**, **S**, **A**, or **M**) is opposite the index mark. You can do this with the camera at your eye, as the initial letter is also displayed in the viewfinder. Having set the desired exposure mode:

- 1)** Frame your picture.
- 2)** Half press the shutter-release button to activate focusing and exposure. The focus



THE EXPOSURE MODE DIAL



point(s) will be displayed in the viewfinder image. Shutter speed and aperture settings will appear at the bottom of the viewfinder.

- 3)** Dependent on the exposure mode, adjust the shutter speed and/or aperture settings if necessary.
- 4)** Fully depress the shutter-release button to take the picture.

› Programmed auto (P)

In **P** mode the camera sets a combination of shutter speed and aperture that will give correctly exposed results in most situations. This is ideal for snapshots and when time is of the essence, but some may feel it reduces creative control. However, you still have considerable room for maneuver, through options including

Note:

Programmed auto mode is not available with older lenses lacking a CPU. If a non-CPU lens is attached, the camera will switch to Aperture Priority (**A**) mode.

flexible program, exposure lock, exposure compensation, and bracketing.

Flexible program

Without leaving **P** mode you can vary the combination of shutter speed and aperture by rotating the main command dial. This engages flexible program (aka “program shift”). This is a very quick way to achieve virtually the same direct control over the aperture/shutter speed that you get in Shutter Priority (**S**) and Aperture Priority (**A**) modes.

When flexible program is in effect the **P** indication shown in the viewfinder and on the Information Display changes to **P***.



PROGRAM

“**P** mode allows a quick response, but also lets you tailor the camera settings to suit your own creative ideas.”

› Shutter Priority (S)



THE SHUTTER SPEED DIAL

In Shutter Priority (**S**) mode you control the shutter speed while the camera sets an aperture that it thinks will give a correctly exposed result. Controlling the shutter speed is particularly useful when dealing with moving subjects. Shutter speeds can be set between 1/4000–30 sec. The exposure can be fine tuned using exposure lock, exposure compensation, and auto bracketing.

Setting the shutter speed

The obvious way to set the shutter speed is with the shutter speed dial. Press the release button in the center to allow the dial to turn. Alternatively, you can set the dial to **1/3 STEP**. When it's in this position you can use the main command dial to set the shutter speed.

Although using the shutter speed dial is the traditional method, and the one that is most in keeping with the camera's classic vibe, it has some significant limitations.

First, shutter speeds can only be set in 1-stop increments (1/60 sec., 1/125 sec., 1/250 sec., and so on), whereas the main command dial offers $\frac{1}{3}$ -stop increments, which allows much greater precision.

Second, the slowest shutter-speed that can be set via the shutter speed dial is 4 seconds (longer exposures are possible with the **B** and **T** settings, but only in Manual mode). By comparison, the main command dial can be used to set shutter speeds down to 30 seconds.

Some of these limitations can be overcome by setting **Easy shutter speed shift** to **On** in Custom Setting f11. This allows you to use the main command dial to nudge the shutter speed up or down in $\frac{1}{3}$ - or $\frac{2}{3}$ -stop increments, and to set times up to 30 seconds when the dial is at the 4 sec. position. Of course this is welcome, but it seems like an awkward, hybrid way of doing things: if you want this extra level of control, why not set the dial to **1/3 STEP** and use the main command dial?

There's one other position on the shutter-speed dial marked **X**. This relates to the sync speed when using flash and is explained in chapter 4.

Note:

Shutter Priority is not available with older lenses lacking a CPU. If a non-CPU lens is attached, the camera will switch to Aperture Priority mode.

FREEZING MOTION

A shutter speed of 1/500 sec. freezes almost everything in this shot, but there's still some blur in the rotor blades.

The significance of shutter speed

Shutter speed is significant mainly in relation to the way that motion is recorded. In simple terms, faster shutter speeds tend to freeze motion, while slower ones are more likely to record motion with a degree of blur.

This can apply not just to subject movement, but also to any movement of the camera itself. Intentional camera movement, as in a panning shot, can create very effective results. On the other hand, unintentional movement (usually



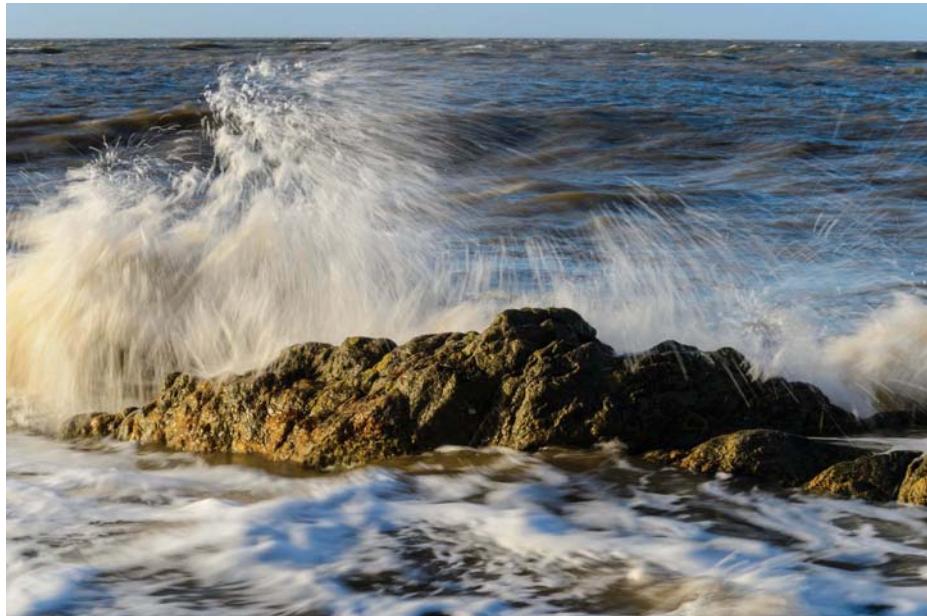
referred to as “camera shake”) can ruin a shot. Fast shutter speeds are one—but only one—of the ways in which you can avoid or minimize the effects of camera shake.

It’s also worth noting that movement is not just a concern for sports and wildlife specialists. Movement can be an issue in portraits (especially with children and animals) and it is also often present in landscape photography, whether it’s

scudding clouds, running water, or foliage swaying in the breeze. Even when you’re shooting in Aperture Priority (**A**) mode, it’s worth keeping one eye on the shutter speed the camera is setting.

HANDHOLDING

I shot at 1/15 sec. here, reckoning this was about the slowest shutter speed I could risk while handholding the camera. Compare the results with the image on page 220, where the shutter speed used was 1/800 sec.



2 » FREEZING THE ACTION

Still photographs can capture motion in many different ways and frequently reveal drama and grace that may be missed with the naked eye or in a movie. The precise shutter speed needed to catch a truly sharp image is dependent not just on the raw speed of the subject, but also on other factors such as its distance from the camera and direction of movement (across the frame or directly toward you). Often you'll have to experiment to see what works. In this example a fast shutter speed froze the action very effectively and allowed me to use a long lens without visible camera shake.

Settings

- › Focal length: 300mm
- › Aperture: f/9
- › Shutter speed: 1/500 sec.
- › ISO: 400



» PANNING

Panning captures movement very differently. By following the subject with the camera, it is recorded crisply (more or less!) while the background becomes blurred, giving your subject a strong sense of speed. You can use relatively slow shutter speeds (anything from 1/8–1/125 sec. is a good starting point), but you'll need to experiment. Panning is usually easiest with a standard or short telephoto lens, provided you can get far enough back from the action. Here I also used flash ensure a sharp image of the rider (and the splash!).

Settings

- › Focal length: 40mm
- › Aperture: f/16
- › Shutter speed: 1/60 sec.
- › ISO: 160

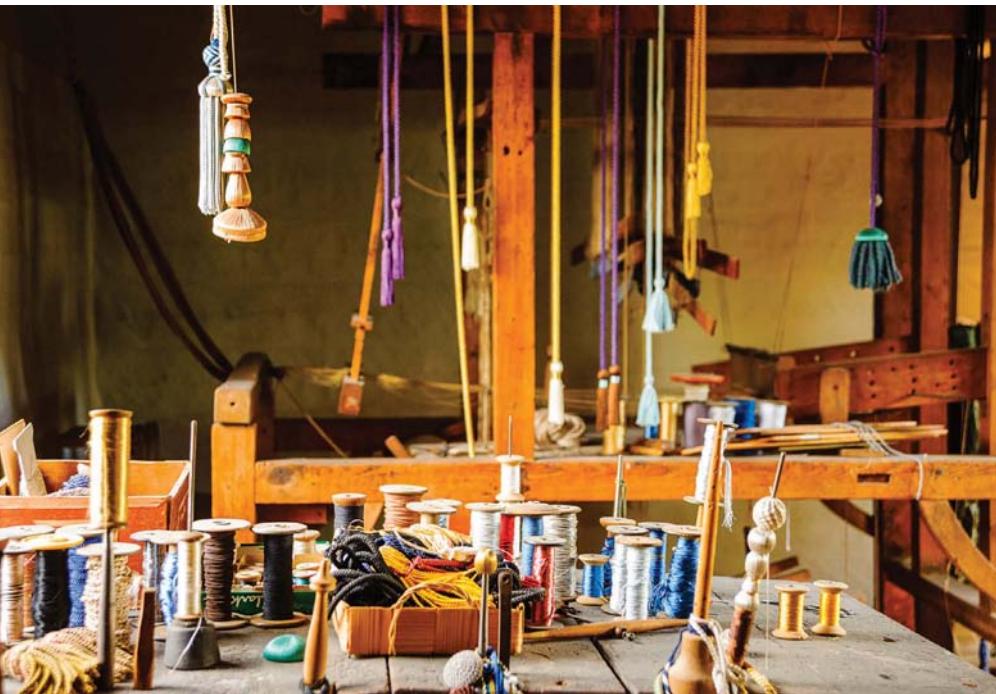


› Aperture Priority (A)

In Aperture Priority (**A**) mode you control the aperture while the camera sets an appropriate shutter speed. Controlling the aperture is useful for determining depth of field. The range of apertures that can be set is determined by the lens that's fitted, and not by the camera. Fine tuning of exposure is possible through exposure lock and exposure compensation, and possibly auto bracketing.

APERTURE PRIORITY

A mode is ideal when you want control over the depth of field. Here I used a wide aperture setting of f/4, as I felt the image might look too cluttered if everything was sharp.



Aperture selection

The “normal” method of aperture selection is to use the sub-command dial, and with modern G-type lenses, which do not have a physical aperture ring, this is the only option. However, rotating the dial only affects the aperture if the exposure meter is active, so if you’re using the viewfinder and the readouts aren’t visible, half press the shutter-release button to activate it. Pressing **INFO** to activate the information display also activates the meter.

With older lenses that have an aperture ring, you can use this to set the aperture instead. If the lens has a CPU—AF-S or AF-D lenses—you have a choice: you can use the sub-command dial or you can use the aperture ring (provided you’ve selected **Aperture ring** under Custom Setting f7).

If the lens does not have a CPU (AI, AI-S, and other manual focus lenses), the

aperture ring is the only way of selecting the aperture. To get the best results when using such lenses you need to specify the maximum aperture of the lens using the **Non-CPU lens data** option found on the Setup menu.

The significance of aperture

The aperture is one of the key factors influencing depth of field. Depth of field describes the zone, in front of and behind the actual point of focus, in which objects appear to be sharp in the final image.

Along with aperture, the other main factors determining depth of field are the focal length of the lens and the camera-to-subject distance. With long lenses and/or close-to subjects, depth of field may remain quite shallow, even at small apertures. This is particularly true in macro photography (see chapter 5).

Tip

If you want to employ the sub-command dial to set the aperture when using lenses that have an aperture ring, set the aperture ring to its minimum setting (usually f/16 or f/22). Many such lenses have a small tab that will allow you to lock them at minimum aperture.

2 » DEEP DEPTH OF FIELD

For some images you might want to have everything sharp from front to back: this is a traditional approach in landscape photography, for example. You can use “hyperfocal distance” calculators to maximize depth of field, or a rule of thumb such as focusing at “the far end of the foreground,” but if you really want to get the greatest depth of field, you need to try and stack all three key factors (focal length, aperture, and distance) in your favor. This landscape image would look unnatural if any of the scene was unsharp, so I combined a short focal length with a small aperture and careful placement of the focus point (on the shingle just across the stream) to maximize the depth of field.

Settings

- › Focal length: 13mm
- › Aperture: f/11
- › Shutter speed: 1/320 sec.
- › ISO: 320



» SHALLOW DEPTH OF FIELD

Sometimes a shallow depth of field is exactly what you want, as it makes the subject stand out against a soft background. This is commonly used for portraits, and is also often seen in sports and wildlife photography. In fact, in these genres the frequent combination of a long focal length and fast shutter speed means that shallow depth of field can be more of a necessity than a completely free choice. Here, a combination of a long focal length, close subject, and wide aperture means that the depth of field is quite shallow. This concentrates attention on the delicately balanced cairn, but it's still possible to make sense of the setting and the walker in the background.

Settings

- › Focal length: 200mm
- › Aperture: f/5.6
- › Shutter speed: 1/400 sec.
- › ISO: 200



› Manual mode (M)

In **M** mode you control both the shutter speed and aperture for maximum creative flexibility. The options for controlling aperture were described in detail on page 47 and control of the shutter speed was discussed on page 41: this also applies in Manual mode.

Shutter speeds can be set from 1/4000–30 sec. (as in Shutter Priority mode), but Manual mode offers a couple of additional options: **T** and **B**. Both can be set directly with the shutter speed dial, or using the command dial with the shutter speed dial set at **1/3 STEP**. These are the only options that allow you to make exposures longer than 30 seconds. This can prove particularly useful for subjects such as star trails, fireworks displays, and moonlit landscapes.

The exposure meter gives no reading when **B** or **T** are set, as the camera does

not know what the exposure time will be. Depending on your subject, it may be that the only way to get the exposure right is through trial and error, which can, of course, be a long-winded process. With that in mind, check there is plenty of charge in the battery before undertaking any really long exposures.

B (Bulb)

If you rotate the shutter speed dial to the **B** position (or set it with the main command dial), **Bulb** appears in the viewfinder, control panel, and Information Display.

In Bulb mode, the shutter remains open for as long as the shutter-release button is held down. However, holding it down with your finger can cause camera shake and soon becomes tedious and uncomfortable. It makes much more sense to use a cable release or remote cord (see chapter 7).



MANUAL

This shot of the Monch, Switzerland, was potentially challenging, as large expanses of snow can skew exposure readings. I used Manual mode and viewed the histogram display on playback to check the exposure.

«

T (Time)

If you rotate the shutter speed dial to the **T** position (or select it using the command dial) **Time** appears in the Information Display. The viewfinder and control panel show two dashes instead.

Time is different to Bulb in that you press and release the shutter-release button and the shutter will stay open until you press the shutter-release button again or 30 minutes have elapsed. Exposures of longer than 30 minutes are only possible in **B**, and generally require a locking cable release or remote cord. In both modes you'll need a tripod or some other very solid camera support.

The analog exposure displays

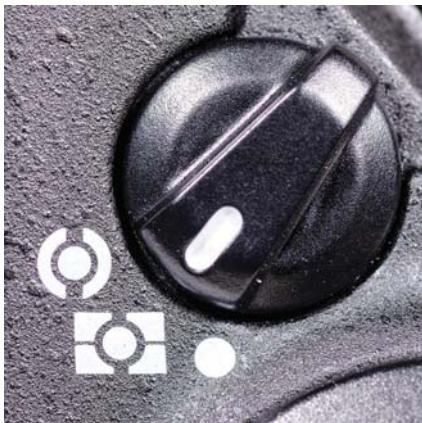
In Manual mode, an analog exposure display appears at the center of the viewfinder readouts and in the Information Display. This shows whether the photograph would be under- or overexposed at the current settings.

If you adjust the shutter speed and/or aperture until the indicator is aligned with the 0 mark at the center of the display, the exposure you have set matches the camera's recommendation. The Df's excellent metering means that this will generally be correct, but if time allows, it is always helpful to review the image and check the histogram display after taking a shot. If necessary, adjustments can then be made for creative effect or to achieve a specific result.



LONG EXPOSURE

A 5-minute exposure makes moonlight appear almost like daylight in this shot—until you see the city lights at far right.



METERING MODE SELECTOR

Metering—the measurement of light levels—is crucial in producing good images. The Nikon Df provides three different metering modes and between them they should cover any eventuality. You can switch between them using the metering selector: the viewfinder and Information Display will both show the mode selected.

› Matrix (3D color matrix metering II)

Using a 2016-segment color sensor, 3D color matrix metering II analyzes the brightness, color, and contrast of a scene. With G-type or D-type Nikkor lenses the

system also uses the subject distance to further refine the exposure. With other CPU lenses this distance information is not used (known as Color matrix metering II).

If non-CPU lenses are to be used, Color matrix metering II can still be employed, provided the focal length and maximum aperture have been specified in **Non-CPU lens data** via the Setup menu.

Matrix metering is recommended for the vast majority of shooting situations and will generally produce excellent results.

› Center-weighted metering

This very traditional form of metering will be familiar to anyone with experience of older 35mm SLR cameras. Here the camera meters from the entire frame, but gives greater importance to the central area. The default setting for this area is a circle measuring **12mm** in diameter, but if a CPU lens is attached this can be changed to **8mm, 15mm, or 20mm** using Custom Setting b1. You can also choose **Average** metering, which meters equally from the whole frame area.

Center-weighted metering can be useful in areas such as portraiture, where the key subject occupies the central portion of the frame.

› Spot metering

In this mode the camera meters from a circle measuring 4mm in diameter (just 1.5% of the frame). If a CPU lens is fitted, the spot meter area will be centered on the current focus point, allowing you to meter quickly from an off-center subject. With a non-CPU lens, or if Auto-area AF is in use, the metering point will be at the center of the frame.

Effective use of spot metering requires some experience, but in critical conditions it offers unrivalled accuracy. It is important

to understand that spot metering attempts to reproduce the subject area as a midtone and this must be allowed for if the subject is significantly darker or lighter than a midtone (by using exposure compensation, for example).

SPOT METER

With the bright sky, sunlit mist, and deep shadows, the contrast was very high in this scene. As I wanted to retain good detail throughout, I used spot metering to help me strike the right balance.



» EXPOSURE COMPENSATION

The Df will deliver accurate exposures under most conditions, but no camera is infallible. Nor can it read your mind or anticipate your creative ideas: sometimes it needs a little help to get the right result.

To some extent, all metering systems rely on the assumption that key subject areas have average tonal value and should be recorded as a midtone, but sometimes this can deliver unwelcome results. For example, snow scenes can appear unduly dark, as the metering reproduces the predominantly light tones as midtones.

Digital cameras make it straightforward to detect when exposure compensation may be needed, as you can check the image (and its histogram) after shooting. The basic principle is simple: to make the subject lighter (to keep light tones looking light), increase the exposure by using positive compensation. Conversely, to keep dark tones looking dark, you should use negative compensation.

If this judgement is difficult, or the lighting conditions are particularly extreme, an extra level of “insurance” is available through exposure bracketing. Shooting Raw also gives extra room to maneuver in postproduction, however, it’s still best to aim for an accurate exposure in the first place.

› Using exposure compensation



EXPOSURE COMPENSATION DIAL



Exposure compensation can be applied between ± 3 stops in $1/3$ -stop increments. To use exposure compensation, press the exposure compensation dial release lock and rotate the dial to set negative or positive compensation as required.

As well as reading directly off the dial, you can see the compensation value change in both the viewfinder and the Information Display. The value is displayed in both analog and digital forms: the **O** at the center of the exposure display flashes when exposure compensation is in effect.



An example of a bracketed sequence of exposures. The exposures were made at -1EV (top), 0EV (middle), and +1EV (bottom), giving me three options.



Tips

Reset exposure compensation as soon as possible, otherwise it will apply to later shots that don't need it.

Don't use exposure compensation in Manual mode. It doesn't affect the actual shutter speed/aperture values, but can give misleading exposure readouts. In any case, setting the exposure so that the analog display reads on the - side is equivalent to using negative compensation, and vice versa on the + side.



BKT BUTTON



Often the quickest and most convenient way to make sure that an image is exposed correctly is to take a series of frames at differing exposures and select the best one later. The Df's bracketing facility allows this to be done very quickly, especially when used with the **CH** (Continuous High speed) release mode.

1) Select **Auto bracketing set** (Custom Setting e6) and set it to **AE only** to make sure that only exposure values are varied.

2) Hold **BKT** and rotate the main command dial to select the number of shots (**2**, **3**, or **5**) required for the bracketing burst. The selected number is displayed in the Information Display, which activates automatically. You can't see the detailed settings in the viewfinder, which merely displays a **BKT** icon when bracketing is set.

If selecting two shots, choose between **-2** (normal + underexposure) or **+2** (normal + overexposure).

3) Still holding **BKT**, rotate the sub-command dial to select the exposure increment between each shot in the sequence. Possible values are: **0.3EV**, **0.7EV**, **1EV**, **2EV**, and **3EV**. The selected increment is shown in the Information Display.

4) Frame, focus, and shoot normally. The camera varies the exposure with each frame until the sequence is completed. If you shoot the sequence as a burst in **CH** or **CL** release mode, the camera will pause at the end of the sequence even if you keep the shutter-release button depressed fully.

5) To cancel bracketing and return to normal shooting, press **BKT** and rotate

Tip

Using exposure bracketing while shooting moving subjects is a lottery: the frame with the best exposure may not coincide with the subject being in the best position. Ideally, use another method to get the exposure settings right before shooting action sequences.

the main command dial until **OF** appears in the Information Display, or the **BKT** icon disappears in the viewfinder. The bracketing increment that you chose using the sub-command dial will remain in effect next time you initiate bracketing.

The Df offers various forms of bracketing: choose between them using Custom Setting e6. The options are **AE and flash**, **AE only**, **Flash only**, **WB bracketing**, and **ADL bracketing**.

AE and flash varies both the exposure and the flash level; **Flash only** varies the flash level without changing the base exposure; **WB bracketing** varies the White balance setting; **ADL bracketing** varies the level of Active D-Lighting applied.

› Exposure lock

Exposure lock is fairly self-explanatory. It is also, for many users, the quickest and most intuitive way to fine tune the camera's exposure setting. It's useful, for instance, in situations where very dark or light areas (especially light sources) within the frame can over-influence exposure.

Exposure lock allows you to meter from a more average area (by pointing the camera in a different direction or stepping closer to the subject), and then hold that exposure while reframing your shot.

Using exposure lock

1) Aim the camera in a different direction or zoom the lens to avoid the potentially problematic dark or light areas. If you're using center-weighted or spot metering, look for midtone areas that are receiving the same sort of light as the main subject.

2) Press the shutter-release button down halfway to take a meter reading, then keep it half-pressed as you press **AE-L/AF-L** to lock the exposure value.

3) Keep **AE-L/AF-L** held down as you reframe the image and shoot in the normal way.

By default, **AE-L/AF-L** locks focus as well as exposure. This can be changed using Custom Setting f4 **Assign AE-L/AF-L button**. There are several options, but the most relevant for using exposure lock is **AE Lock only**. You can also opt for **AE Lock (hold)**. In this case you can release **AE-L/AF-L** after step 2 and the exposure will remain locked until you press **AE-L/AF-L** again, or the meter turns off.

Note:

Nikon does not recommend using exposure lock when you're using matrix metering, but don't let that stop you if matrix metering does not produce the desired result.

2 » ISO

The Df may appear superficially similar to a classic 35mm SLR, but in reality it's a very different beast. Nothing underlines that more than the ability to set a different ISO for every shot. The wide and flexible ISO ranges of digital cameras (especially those

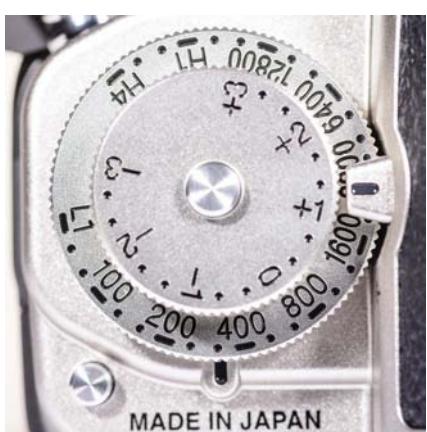


with larger sensors, such as the Df) are among their very best features and the ability to pick a different ISO for every single shot if you need to is truly liberating.

The Df offers "regular" ISO settings from ISO 100 to ISO 12,800 and the sensor is just about the best there is for low-light/high ISO photography. At ISO 3200, for instance, image noise is barely visible in full-screen images or medium-size prints.

In addition there are "extension" settings beyond the standard range: Lo0.3 is equivalent to ISO 80, Lo0.7 to ISO 64, and

ISO DIAL SET TO ISO 320



ISO 6400

A high ISO setting was essential to catch this shot without flash.

Lo1.0 to ISO 50. The Hi settings take the ISO ratings to levels unimaginable with film, and although noise becomes more obvious, it is still possible to produce usable images. These settings are Hi0.3 (equivalent to ISO 16,000), Hi0.7 (ISO 20,800), Hi1.0 (ISO 25,600), Hi2.0 (ISO 51,200), Hi3.0 (ISO 102,400), and Hi4.0 (ISO 204,800).

Note:

The ISO setting governs the camera's sensitivity to greater or lesser amounts of light. At higher ISO settings, less light is needed to capture an acceptable image.

Setting the ISO

To change the ISO setting, press the ISO dial release button and hold it in as you turn the dial until the desired value is opposite the index mark. The ISO setting is also shown in the Information Display, and it updates in the viewfinder as you turn the dial. This makes it possible to adjust the ISO with the camera at your eye, although the position of the ISO dial and shutter-release button makes it slightly awkward. Unlike other Nikon DSLRs, there's no option to set the ISO through the Shooting menu (not that this is any great loss).

› Auto ISO sensitivity control

Although you can't set the ISO via the Shooting menu, there is an option called **Auto ISO sensitivity control**. However, it's important to understand that this does not make ISO control fully automatic (as it is when you use auto ISO on one of Nikon's "consumer" DSLRs).

Even when **Auto ISO** is set to **On**, you still set the ISO on the Df: the difference is that the camera will depart from the selected ISO if it determines that this is required for correct exposure. For example, if you are using Shutter Priority with a shutter speed of 1/1000 sec. and ISO 100, the prevailing light levels may not allow correct exposure within the lens' aperture range. In this situation the camera will adjust the ISO until it can achieve an acceptable exposure.

Auto ISO options

Maximum sensitivity allows you to limit the maximum ISO the camera uses when applying Auto ISO sensitivity control. You may feel that image noise is unacceptable above ISO 3200, for example, and therefore set this as the limit. Obviously, what you feel constitutes "acceptable" is partly a matter of taste and partly dependent on the intended use of the images.

Minimum shutter speed allows you to set the minimum shutter speed that the camera will employ before adjusting the ISO automatically. This only applies in **P** and **A** modes: in **S** and **M** modes the camera will continue to use the shutter speed you have set.

The submenu also includes an **Auto** option; within this you can make a choice along a scale from **Slower** to **Faster**. If you err toward **Faster**, the camera will increase the ISO more quickly to maintain faster shutter speeds. The camera's decision about what shutter speed is acceptable is influenced by the focal length in use; longer lenses require higher shutter speeds to avoid camera shake. If you use a range of focal lengths, the flexibility offered by the Auto option is appealing.

› ISO choices

As well as accommodating lower light levels, higher ISO settings are also useful when you want to use a small aperture to increase depth of field and/or a fast shutter speed to freeze rapid movement.

Conversely, lower ISO settings are useful in brighter conditions and/or when you want to use a wide aperture or slow shutter speed.

However, it's not a completely free lunch. Higher ISO settings change the quality of images. Most obviously, image noise increases: the Df manages

it exceptionally well, but even so it does eventually become apparent, especially in images viewed or printed at large sizes. Noise appears as speckles of varying brightness or color and is most obtrusive in areas that should have an even tone, such as clear skies.

Higher ISO settings also reduce contrast and produce less saturated colors.

Tip

Even the Df is not immune to image noise at higher ISO speeds, but it's easy to overreact. Viewed at 100%, some images may appear dreadful, but this type of "pixel peeping" does not reflect "normal" viewing—images may be perfectly acceptable for full-screen viewing and everyday printing. Experiment with ISO and noise reduction settings to see what level of image noise is acceptable for your needs.

» BASE ISO

The combination of a moving subject and poor weather might suggest a high ISO would be beneficial here. However, as I wanted to employ a wide aperture and slow shutter speed, I kept the ISO rating close to its base level.

Settings

- › Focal length: 46mm
- › Aperture: f/4.2
- › Shutter speed: 1/50 sec.
- › ISO: 140



2 » HIGH ISO

The quality of the Df's sensor means that ISO ratings up to ISO 3200 can be used almost casually. This is incredibly valuable when it comes to capturing images without flash, especially when using it would be distracting to your subject, as here. This is especially true of sports photography, and it's no coincidence that the same sensor is used in Nikon's D4, which is the backbone of many a professional sports photographer. In fact, there is some evidence that minor tweaks to the sensor and associated circuitry have made the Df's high ISO/low-light performance slightly better even than the benchmark D4.



Settings

- › Focal length: 70mm
- › Aperture: f/5
- › Shutter speed: 1/40 sec.
- › ISO: 1600

» LOW ISO

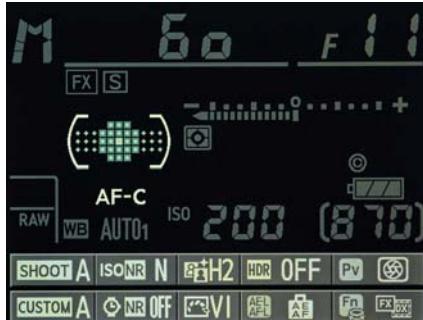
While the upper reaches of the ISO range offer possibilities that were simply unattainable on film, low ISO settings are still immensely valuable. Almost every camera delivers its best quality at its “base” ISO, which for the Df is ISO 100. This is the setting that gives you the widest dynamic range and greatest depth of color. Of course, there are also times when a long shutter speed is a positive boon—as long as you use a decent tripod or some other solid camera support. The Lo settings (down to ISO 50) help you achieve even longer exposure times, although there is a small loss of dynamic range compared to ISO 100.



Settings

- › Focal length: 28mm
- › Aperture: f/11
- › Shutter speed: 1/8 sec.
- › ISO: 100

» FOCUSING



FOCUS MODE SELECTION IN THE INFORMATION DISPLAY

Focusing is not simply about ensuring that “the picture” is in focus. In fact, it’s actually quite difficult (and sometimes impossible) to ensure that everything in an image appears sharp. The first essential step is making sure that the camera focuses on the desired subject, or the right part of the subject. Controlling the depth of field then helps you determine how much of the rest of the image will also be sharp.

The various focus options boil down to how the camera focuses (determined by the focus modes) and where it focuses (what the subject is, if you like). This is determined by the AF-area mode.

To switch between manual focus and autofocus use the focus selector switch on the front of the camera close to the lens mount. To choose the AF mode

(**AF-S** or **AF-C**) press the center of the focus mode selector switch and rotate the main command dial. While you do this, the settings can be seen in the viewfinder and Information Display. The Information Display continues to show the mode that is in operation.

› Single-servo AF (AF-S)

The camera focuses when the shutter-release button is pressed down halfway. Focus remains locked on this point as long as you maintain half pressure. The shutter cannot release to take a picture unless focus has been acquired (**Focus priority**). This mode is recommended for accurate focusing on static subjects.

› Continuous-servo AF (AF-C)

In this mode (which is recommended for moving subjects), the camera continues to seek focus as long as the shutter-release button is depressed: if the subject moves, the camera will refocus. The camera is able to take a picture even if perfect focus has not been acquired (**Release priority**).

The Df employs predictive focus tracking; if the subject moves while AF-C is active, the camera analyzes the movement and attempts to predict where the subject will be when the shutter is released.

Tip

The Focus priority and Release priority settings can be changed using Custom Settings a1 (for AF-C) and a2 (for AF-S).

› Manual focus (M)

In time-honored fashion, focusing is done manually using the focusing ring on the lens. This seems very much in keeping with the “Pure Photography” ethos of the Df, and many photographers still appreciate the extra level of control and involvement that comes with focusing manually. It’s also true that certain subjects and circumstances can fool even the best AF systems.

The process hardly requires description: set the focus mode selector to **M** and use the focusing ring on the lens to bring the subject into focus in the viewfinder.

Tip

*Some lenses have an A/M switch. Make sure this—as well as the selector on the camera—is set to **M** to set manual focus.*

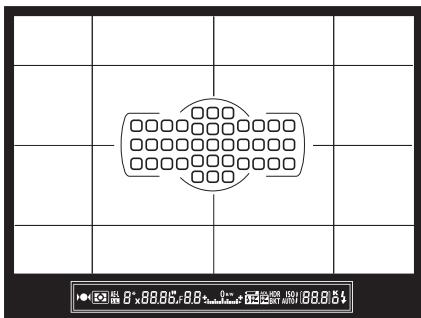
› Electronic rangefinder

When focusing manually, you can still take advantage of the camera’s focusing technology thanks to the electronic rangefinder, which confirms when a subject is in focus. Focusing this way can be more precise than just relying on the viewfinder image. It requires a lens of f/5.6 or faster (f/8 when using the central focus points), and light levels that would allow AF to be used.

The rangefinder requires an appropriate focus area to be selected as if you were using one of the AF modes. When a subject in that area is in focus a green dot appears at the far left of the viewfinder readout.

› AF-area modes

The Df has 39 focus points covering the central portion of the frame (indicated by a faint outline in the viewfinder). To focus on the desired subject it’s vital that the camera uses appropriate focus point(s); this is the function of the AF-area mode. To choose the AF-area mode, press and hold the button at the center of the focus mode selector switch and rotate the sub-command dial. The viewfinder and Information Display show which mode is selected, and the active focus points.



DF VIEWFINDER

The viewfinder displays the available focus areas, as well as an in-focus indicator at the left of the menu bar.

Single-area AF [□]

In this mode, you select the focus point, using the multi-selector to move through the 39 available focus points. The chosen focus point is then illuminated in the viewfinder. This mode is best suited to relatively static subjects.

Dynamic-area AF [□]

This AF-area mode is more complicated, as it has several sub-modes. These can only be selected when the AF mode is AF-C.

In all sub-modes, you select the initial focus point (as in Single-area AF), but if the subject moves, the camera will employ other focus points to maintain focus and track the subject you selected. The sub-mode options determine the number of focus points that will be employed for this: 9, 21, or the full 39 points.

The final option is 3D tracking, which uses a range of information, including subject colors, to track subjects that may be moving erratically.

Tip

Unless the subject is definitely (and only) moving directly toward or away from the camera, I nearly always find 3D tracking the most effective mode for action shooting.

Auto-area AF [■]

This mode makes focus point selection fully automatic. In other words, the camera determines where (and what) the subject is. When G-type or D-type lenses are used the camera employs face-detection technology. If a human face is detected, it will be prioritized for focusing—which is fine if this is indeed what you want.

Focus points

The Df's 39 focus points cover the central part of the frame, and most of the width of the DX crop area. This allows quick and accurate selection to cover most subjects, whether it's a static focus point when using AF-S or the initial focus point when using AF-C. You can't manually select the focus point when [■] Auto-area AF is engaged.

Focus point selection

- 1) Make sure the collar around the multi-selector is unlocked.
- 2) Using the multi-selector, move the active focus point to the desired position. Pressing **OK** selects the central focus point.
- 3) Press the shutter-release button halfway to focus at the desired point (AF-S) or to set the initial focus point (AF-C). Press the shutter-release button down fully to take the shot.



Shifting the focus point from the foreground pylon (top) to a more distant point (bottom) gives this shot a very different emphasis. 

Note:

Custom Setting a6 allows you to activate **Focus point wrap-around**, which means that if you select a focus point at the edge of the available area, a further press on the multi-selector in the same direction takes it to the focus point at the opposite edge of the area.

› Focus points

Although the Df's focus points cover a wide area, they do not extend to the edges of the frame, even in DX crop. If you need to focus on a subject that doesn't coincide with any of the focus points, the simplest procedure is as follows:

- 1) Adjust your framing to bring the subject within the area covered by the focus points.
- 2) Select a focus point and focus on the subject in the normal way.
- 3) Lock focus. In AF-S mode this can be achieved by maintaining half pressure on the shutter-release button, or pressing and holding **AE-L/AF-L**. In AF-C mode, only **AE-L/AF-L** can be used.

4) Reframe the image as desired and press the shutter-release button fully to take the picture. If you keep half pressure on the shutter-release button (in AF-S) or hold down **AE-L/AF-L** (in either AF mode), focus will remain locked for further shots.

Note:

At the default settings, **AE-L/AF-L** locks exposure as well as focus, but this can be changed using Custom Setting f6 (see page 120).

There's another reason for using this technique: the center focus point is the most sensitive. This means the camera can focus with it when the other AF points struggle. In such conditions it only takes a moment to focus using the center point and then recompose your shot. You could even lock the multi-selector so you can't shift accidentally to another AF point.

RECOMPOSING

Although the nearest rock is outside the area covered by the AF points, it took less than a second to focus on it, lock focus, and reframe the image.



» IMAGE QUALITY

The Df's Image quality settings are not some miraculous way of ensuring great pictures—that's still ultimately down to the eye of the photographer. In this context, "image quality" refers to the file format, or the way that image data is recorded. The Df offers a choice of three file types: NEF, TIFF, and JPEG.

The essential difference is that TIFF and JPEG files undergo significant processing in-camera to produce files that should be usable right away, without the need for further processing on your computer.

By comparison, NEF files record the raw data from the camera's sensor "as is," giving much greater scope for further processing to achieve exactly the desired pictorial qualities. This requires suitable software such as Nikon Capture NX2 or Adobe Lightroom (see Chapter 8). "Raw" or "Camera Raw" is a generic term for this kind of file, while NEF is a specific Raw file format used by Nikon.

NEF files can be recorded in either 12-bit or 14-bit depth. 14-bit files capture four times more color information, but produce larger file sizes, which may in turn mean that the camera takes fractionally longer to write them to the card. Any such slow-down is only likely to be noticeable when shooting at high frame rates.

As a further refinement, the Df allows two versions of the same image to be

recorded simultaneously; one Raw and one JPEG. The JPEG can be used as a quick reference file for immediate needs while the Raw version can be processed later for the ultimate result.

In fact, every Raw file includes an embedded JPEG image. This is used for image review and playback, and is also the basis of the histogram and highlights displays. However, you can't extract this JPEG for standalone use.

Tip

Historically, TIFF files were regarded as giving better quality images than JPEG, but in reality it's hard to detect any superiority over JPEG Fine. The TIFF format does produce much larger files, which quickly fill up memory card (and hard drive) space. Unless you have a specific reason to shoot TIFF, the real choice is between JPEG and Raw: you can always convert JPEGs into TIFFs on the computer if they need editing.

› Setting image quality

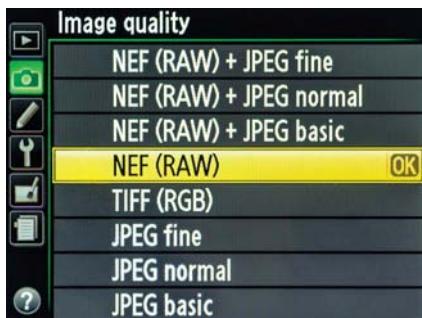


IMAGE QUALITY DIALOG

There are two ways to set **Image quality**:

- 1) Hold down the button and rotate the main command dial until the required setting is displayed in the Information Display. This is usually the easier method.
- 2) From the Shooting menu, select **Image quality** using the multi selector, then highlight and select the required setting.

Use **NEF (RAW) recording** from the Shooting menu to determine whether NEF files are recorded at 12-bit or 14-bit depth.

Image quality options

NEF (RAW)	12- or 14-bit Raw files are recorded for the ultimate quality and creative flexibility. Three further options— Compressed , Lossless compressed , and Uncompressed —can be selected via NEF (RAW) recording in the Shooting menu.
TIFF	8-bit uncompressed TIFF files are recorded.
JPEG Fine	8-bit JPEG files are recorded with a compression ratio of approx. 1:4. Suitable for demanding applications.
JPEG Normal	8-bit JPEG files are recorded with a compression ratio of approx. 1:8. Suitable for many less critical uses.
JPEG Basic	8-bit JPEG files are recorded with a compression ratio of approx. 1:16. Suitable for transmission by email or web site use, but not recommended for printing.
NEF (RAW) + JPEG Fine	Two copies of the same image are recorded simultaneously: one NEF (RAW) + JPEG Normal Raw and one JPEG.
NEF (RAW) + JPEG Basic	

» IMAGE AREA AND IMAGE SIZE

The Df offers options for both **Image area** and **Image size**. It's important to distinguish between them: **Image area** refers to the portion of the sensor used to capture the image, while **Image size** refers to the pixel count of the final image file.

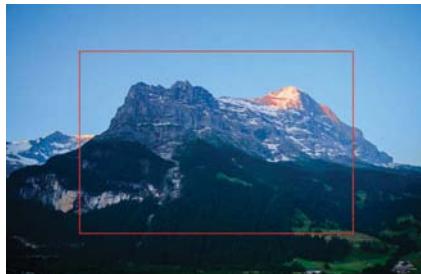
› Image area

The Df normally captures images using the whole of its 35.9 x 24mm FX format sensor (labeled **FX (36 x 24)** for brevity). It can also be set to **DX (24 x 16)**, which captures images using the central 24 x 16mm area of the sensor—equivalent to a DX format sensor. This allows the use of DX lenses. Choose your preferred setting via the **Image area** item on the Shooting menu.

If you opt for **DX (24 x 16)**, the viewfinder display adapts by showing a heavy outline around the DX area. The

IMAGE AREA

DX crop area (red) superimposed on FX frame.



area excluded by this selection can also be shown grayed out, which may make framing easier, but only when **AF point illumination** (Custom Setting a5) is **Off**.

In Live View the screen image directly reflects the selected image area.

› Using DX lenses

DX lenses are designed for optimum performance with the smaller DX format sensor used in cameras such as the D7100. They do not cover the full area of the FX format sensor, so the corners of the frame would be blacked out if they were to be used—an extreme case of vignetting.

By default, the Df automatically detects when a DX lens is fitted and sets a DX format crop. This option can be turned **Off** using the **Auto DX crop** item under **Image area** in the Shooting menu.

Tip

DX crop boosts the effective focal length of your lenses. When shooting fast and unpredictable action there is an extra benefit: the AF sensors will cover most of the DX frame. Of course, the image size is smaller (approximately 6 megapixels), but this is still big enough for many purposes.

› Image size

For each Image area, the Df offers three **Image size** options. When the **Image area** is set to **FX (36 x 24)**, setting **Image size** to **Medium** produces an image roughly equivalent to a 9 megapixel camera. Images of this size can comfortably yield good-quality prints to at least A4 or 12 x 8 inches in size.

Setting **Image size** to **Small** (with **Image area** set to **FX (36 x 24)**) produces images with a resolution of approximately 4 million pixels. Although small, this still exceeds the maximum resolution of most computer monitors.

The smaller sizes take up far less space on memory cards and computer hard drives, but in all other important respects (such as noise and dynamic range) these images will be far superior to those produced by most smaller cameras.

Tip

These options only apply to TIFF and JPEG images: Raw files are always recorded at the maximum size for the selected Image area.

Setting Image size

There are two ways to set **Image size**:

- 1) Hold down  and rotate the sub-command dial until the required setting is displayed in the Information Display. This is usually felt to be the easier method.
- 2) Select **Image size** from the Shooting menu using the multi-selector, then highlight and select the required setting.

Image area	Size (Large)	Size (Medium)	Size (Small)
FX (36 x 24)	4928 × 3280 pixels	3696 × 2456 pixels	2464 × 1640 pixels
DX (24 x 16)	3200 × 2128 pixels	2400 × 1592 pixels	1600 × 1064 pixels

» COLOR

› White balance

Both natural and artificial light sources vary enormously in color. The human eye and brain are very good (although not perfect) at compensating for this, so we see people and objects in their “true” colors—we nearly always see grass as green, and so on.

Digital cameras also have a capacity to compensate for the varying colors of light, and used correctly the Df can produce natural-looking colors under almost any conditions you'll encounter. The Df has a sophisticated system for determining white balance (WB) automatically and this produces very good results most of the time. For finer control, or for creative effect, the camera also offers a range of user-controlled settings.

Tips

When shooting Raw images, the in-camera WB setting is not crucial, as white balance can be adjusted when the file is processed. However, it affects how images look on playback and review, so there is still some value in setting WB appropriately.

Sometimes, setting the “correct” color is not desirable. A classic example is shooting landscapes by the warm light of early morning or late evening, where the reddened hue of the sunlight is part of the appeal. Auto White Balance may neutralize this effect, so you may find it better to try the Direct sunlight setting, or better still, shoot Raw images.

2



DIRECT SUNLIGHT



FLASH



CLOUDY



SHADE



INCANDESCENT



COOL-WHITE FLUORESCENT

Icon	Menu option	Color temperature (K)	Description
AUTO	Auto	3500–8000	Camera sets WB automatically, based on information from imaging and metering sensors. Most accurate with G-type and D-type lenses.
	Incandescent	3000	Use under incandescent (tungsten) lighting, such as traditional household bulbs.
Fluorescent (submenu offers seven options):			
	1) Sodium-vapor lamps	2700	Use under sodium-vapor lighting, often used in sports venues.
	2) Warm-white fluorescent	3000	Use in warm-white fluorescent lighting.
	3) White fluorescent	3700	Use in white fluorescent lighting.
	4) Cool-white fluorescent	4200	Use in cool-white fluorescent lighting.
	5) Day white fluorescent	5000	Use in daylight-balanced white fluorescent lighting.
	6) Daylight fluorescent	6500	Use in daylight fluorescent lighting.
	7) High temp. mercury-vapor	7200	Use in high color temperature lighting, such as mercury vapor lamps.
	Direct sunlight	5200	Use for subjects in direct sunlight.
	Flash	5400	Use with built-in flash or separate flash.
	Cloudy	6000	Use in daylight, under cloudy/overcast skies.
	Shade	8000	Use on sunny days for subjects in shade.
K	Choose color temp.	2500–10,000	Select color temperature from list of values.
PRE	Preset manual	n/a	Derive white balance direct from subject or light source, or from an existing photo.

Setting white balance

There are two ways to set white balance:

- 1)** Hold down **?/OK** and rotate the main command dial until the required symbol is displayed in the Information Display. This is generally the quicker method.
- 2)** Select **White balance** from the Shooting menu using the multi-selector. Highlight and select the required setting.

› Fine tuning WB

The basic options offered by **?/OK** and the main command dial, or the top level of the Shooting menu are just the start, as the white balance setting can be fine tuned in several ways.

Fine tuning WB with the sub-command dial

For most of the standard WB settings, if you hold **?/OK** and turn the sub-command dial, you'll see a letter and number in the Information Display. Turn the dial to the left to shift the image toward amber (settings **a1-a6**); turn it to the right to shift the image toward blue (settings **b1-b6**).

Fine tuning WB via the Shooting Menu

When you select **Auto** in the Shooting menu there are two sub-options: **Normal (AUTO₁)**, which keeps colors correct

as far as possible, and **Keep warm lighting colors (AUTO₂)**, which does not fully correct warm hues such as those generated by incandescent lighting. This could be worth experimenting with for sunrise/sunset shots as well.

If you select **Incandescent, Direct sunlight, Flash, Cloudy, or Shade**, and then press **▶**, a graphic display appears that allows you to fine tune the setting using the multi-selector. When done, press **OK** to accept the new value.

When you select **Fluorescent**, a sub-menu appears from which you can select the appropriate variety of fluorescent lamp (the default is **4: Cool-white fluorescent**). If required, you can then press **▶** to fine tune the balance.

Notes:

Energy-saving lightbulbs are compact fluorescent units, which have largely replaced traditional incandescent (tungsten) bulbs in domestic use. Their color temperature varies, but many are rated around 2700K, equivalent to Fluorescent setting **1: Sodium-vapor lamps**.

With any unfamiliar light source it's always a good idea to take test shots if possible, or allow for adjustment later by shooting Raw files.

› Choose color temp. K

This option allows you to dial in a specific color temperature. If you select it using the main command dial you can adjust the numerical value using the sub-command dial. If you select it via the Shooting menu, you gain the option to adjust the balance on a green-magenta scale alongside the color temperature scale.

› Preset manual white balance

You can set the white balance to precisely match any lighting conditions, either by taking a reference photo of a neutral white object, or by copying white balance data from an existing image on the memory card. This is undoubtedly a valuable facility when absolute color accuracy is required (for instance for professional images of fabrics or artwork) but it is, quite frankly, a complicated procedure that few of us will ever employ. If you do need to do this for JPEG or TIFF images, see the Nikon Reference manual for details: you'll see that it covers a total of 10 pages.

It's normally much easier to shoot Raw and tweak the white balance later, although a reference photo is helpful for this when high precision is required. The Raw route is not only easier in itself, but also avoids the pitfall that the manual WB setting will go on being applied to shots when it's no longer appropriate.

Tip

The endpapers of this book serve as "gray cards," which are ideal as reference photos for setting a preset white balance or for the precise post-processing of Raw images.

› Color space

The Df offers **sRGB** and **Adobe RGB** color spaces, which define the range (or gamut) of colors that are recorded.

sRGB has a narrower gamut, but images often appear brighter and punchier initially. This is the color space typically used on the Internet and most High Street photo printers, which makes it appropriate for images that will be used or printed straight off, with little or no postproduction work. Most mobile devices (and the majority of computer screens) have a narrower gamut even than sRGB.

Adobe RGB has a wider gamut and is commonly used in professional printing and reproduction. It's a better choice for images that are destined for professional applications or where significant post-processing is anticipated.

To select the color space, use the **Color space** option in the Shooting menu.

» TWO-BUTTON RESET

The Df offers a quick way to reset a large number of camera settings (listed below) to their default values. Hold down  and  (marked with green dots) together

for at least 2 seconds. The Information Display will blank out briefly while the reset is completed.

Default setting	
Focus point	Center
Flexible program	Off
AE lock hold	Off
Bracketing	Off
AF mode	AF-S
AF-area mode	Viewfinder: Single-point AF Live view: Normal-area AF
Flash mode	Front-curtain sync
Flash compensation	Off
FV lock	Off
Exposure delay mode	Off
+ NEF (RAW)	Off
Image quality	JPEG Normal
Image size	Large
White balance	Auto (Normal) (Fine tuning off)
Picture Control	Current Picture Control reset to base settings
HDR	Off
Auto ISO	Off
Multiple exposure	Off
Interval timer shooting	Off

» LIVE VIEW

Live View is one feature that certainly wasn't available to users of classic 35mm SLRs. There may even be some who think that its inclusion on the Df compromises the camera's guiding ethos of "Pure Photography," although this seems to me to be taking the purist approach too far. Unless you want to do away with the rear screen altogether, there is very little to lose and a good deal to gain from the availability of Live View.

It is not, however, the answer to everything. An SLR is essentially designed around the viewfinder, which still has many advantages: it's more intuitive and offers the sense of a direct connection to the subject; there's much less risk of camera shake; viewfinder-based autofocus is faster.

However, to get the full benefit from the high image quality of today's cameras, critical users will use tripods regularly, which takes away much of the ergonomic advantage of using the viewfinder. Also, Live View focusing, although slower than using the viewfinder, is more precise.

› Using Live View

To activate Live View, press the **Lv** button on the rear of the camera. The mirror flips up, the viewfinder blacks out, and the rear monitor screen displays a continuous live preview of the scene. A range of shooting



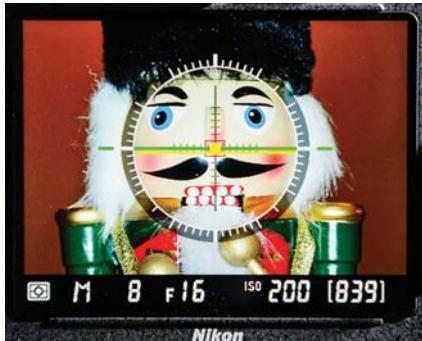
LIVE VIEW ACTIVATION BUTTON



information is displayed at the top and bottom of the screen, partly overlaying the image. Pressing **INFO** changes this display, cycling through a series of screens: a further press returns to the starting screen.

Press the shutter-release button fully to take a picture, as when shooting normally. If you're shooting in **C_H** or **C_L** release mode, the mirror stays up and the monitor remains blank between shots, making it hard to follow moving subjects.

Live View info	Details
Show photo indicators (default)	Information bars superimposed at top and bottom of screen.
Hide indicators	Top information bar disappears; key shooting information still shown at bottom.
Framing grid (4 x 4)	Grid lines appear, useful for critical framing.
Framing grid (3 x 3)	
Virtual horizon	Displays a horizon indicator on the monitor to assist in leveling the camera.
Aspect ratio (16:9)	Framing lines show area covered by 16:9 aspect ratio.
Aspect ratio (1:1)	Framing lines show area covered by 1:1 (square) aspect ratio.



LIVE VIEW VIRTUAL HORIZON INDICATOR ↗

Tip

The aspect ratio guidelines may help with framing an image that you know will be cropped later. The camera does not crop the image itself, although you can use the **Trim** option in the Retouch menu.

› Changing settings in Live View

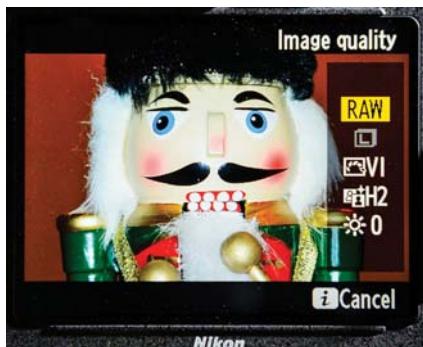
The control dials on top of the camera function in exactly the same way in Live View as in normal shooting, so you can change exposure mode, release mode, shutter speed, aperture, and ISO in the usual way.

Many of the button-and-dial settings work as normal, too. For example, to change the white balance, press and hold **?/On**. The display shows an icon for the current WB setting. You can change this by rotating the main command dial and fine tune it with the sub-command dial as in normal shooting. The Live View image also changes to reflect the new settings.

However, there are some exceptions. For example, you can't use **⊕** to change Image quality settings; pressing this zooms in on the Live View display instead.

Similarly, is used to zoom out so you can't use it to access flash settings. In fact, there does not appear to be any way to change the flash settings in Live View—you'll have to exit by pressing **Lv**, change settings, and then re-enter Live View.

› Quick settings



LIVE VIEW QUICK SETTINGS SCREEN

A number of key settings can be accessed quickly in Live View by pressing . Scroll through the list with / and use to see the options for each one.

Settings accessible in this way are: **Image quality**, **Image size**, **Picture Control**, **Active D-lighting**, and **Monitor brightness**. If you change the Picture Control, the Live View image changes too: if you set **Monochrome**, the image becomes black and white, for example.

› Exposure preview

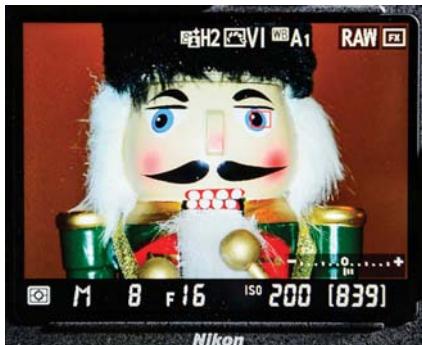
The Df's Live View mode offers a form of exposure preview, but only when the camera is in Manual exposure mode. In this situation, pressing the Pv button makes the screen darken if the camera predicts underexposure, and brighten if it predicts overexposure. Release Pv, change exposure settings (aperture, shutter-speed, and/or ISO) and press Pv again to see the effect.

This feature is useful, but has its limitations. In very low light levels, the camera may be unable to give an accurate preview and the screen may continue to look dark, even though the indicators show that the selected settings will give the correct exposure.

› Monitor brightness

You can alter the brightness level of the monitor screen in Live View using the Quick Settings screen. This is useful when you want to adapt the screen brightness to surrounding conditions, but it can cause confusion, especially in conjunction with Exposure preview, as changing the screen brightness has no effect on the exposure level of the images you shoot. The best way to verify exposure is to use playback review, including the histogram and highlights displays.

› Focusing in Live View



FOCUSING IN LIVE VIEW

The focus area (red rectangle) can be positioned anywhere on screen.

In Live View, with the mirror locked up, the usual focusing sensor is unavailable. Instead, the camera takes focus information from the main image sensor. This is slower than normal AF operation—often noticeably so—but also very accurate. You can zoom in on the view, which helps place the focus point exactly where you want it (this can be a big help with manual focus too).

Live View has its own set of autofocus options, with two AF modes and four AF-area modes.

› Live View AF modes

The AF mode options are Single-servo AF (AF-S) and Full-time servo AF (AF-F). AF-S corresponds to AF-S in normal shooting: the camera focuses when you press the shutter-release button down halfway, and focus remains locked as long as you maintain that half pressure.

AF-F corresponds roughly to AF-C in normal shooting. However, the camera continues to seek focus as long as Live View remains active; you don't need to have your finger on the shutter-release button. When you do press the shutter-release button halfway, the focus will lock, and remain locked until you release the button or take a shot.

Selecting Live View AF mode

1) Activate Live View with **[Lv]**.

2) Press the AF-mode button at the center of the focus selector and use the main command dial to toggle between **AF-S** and **AF-F**.

› Live View AF-area mode

AF-area mode	Description
Face priority	Uses face detection technology to identify portrait subjects. Double yellow border appears outlining such subjects. If multiple subjects are detected the camera focuses on the closest.
Wide area	Camera analyzes focus information from an area approximately $\frac{1}{6}$ the width and height of the frame; this area is shown by a red rectangle.
Normal area	Camera analyzes focus information from a much smaller area, shown by a red rectangle. This is particularly useful for focusing precisely on small subjects.
Subject tracking	Camera follows selected subject as it moves within the frame.

Selecting Live View AF-area mode

1) Activate Live View.

2) Press and hold the AF-mode button at the center of the focus selector and use the sub-command dial to select the AF-area mode (highlighted in yellow) on the LCD screen.

NORMAL AREA AF

Normal area AF is the best choice for precision and accuracy.



Face priority

When this mode is active, the camera automatically detects up to 35 faces and selects the closest. The selected face is outlined with a double yellow border. You can shift focus to a different person by using the multi-selector to move the focus point. To focus on the selected face, press the shutter-release button halfway.

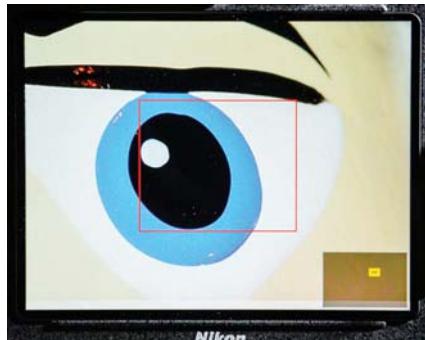
Subject tracking

When you select **Subject tracking**, a white rectangle appears on the screen. Align this with the desired subject using the multi-selector, then press **OK**. The camera “memorizes” the subject and the rectangle turns yellow. It will now track the subject as it moves, and may even reacquire the subject if it leaves the frame briefly.

To focus, press the shutter-release button halfway: the target rectangle blinks green while focusing, and then becomes solid green. If the camera fails to focus it blinks red instead. To restart (pick a new target), press **OK** again.

Note:

Subject tracking isn't fast enough for rapidly moving subjects—viewfinder-based AF is much better for these.



FOCUS ZOOM



Manual focus

Manual focus is engaged as in normal shooting. However the Live View display still reflects the previously selected Live View AF mode. If you've selected **Wide area AF** or **Normal area AF**, the display shows a red rectangle of the appropriate size; if you zoom in for more precise focusing, the zoom centers on the same point as this rectangle.

Tip

*The ability to zoom in for precise focusing is a real plus for Live View, especially for macro work. You can speed up the zooming process using Custom Setting f2: the **Zoom on/off** option allows you to zoom to a desired level with a single press of **OK**.*

› Aperture in Live View

Unlike viewfinder photography, where the aperture remains at maximum until the shot is taken, in Live View the lens is stopped down. This obviously offers a depth of field preview, but if you change the aperture setting while in Live View, the aperture itself doesn't update unless you exit Live View and re-enter, or take a shot.

If you want to take full advantage of precise focusing in Live View, it is advisable to start with the aperture at its widest setting for minimal depth of field; this will make the subject snap in and out of focus more clearly. After focusing, set the aperture to the required shooting setting and make your exposure.

» IMAGE PLAYBACK

The Df's LCD screen makes image playback both pleasurable and informative. To show the most recent image, press . If **Image Review** is **On** (selected from the Playback menu), images are also displayed automatically after shooting. In **C_H** or **C_L** release modes, Image review begins after the last image in a burst is captured; images are shown in sequence.

Use the multi-selector to view other images on the memory card: scroll right to view images in the order of capture, scroll left to view in reverse order.

Note:

To conserve the battery, the monitor turns off after a period of inactivity. The default is 10 seconds, but intervals between 4 seconds and 10 minutes can be set using Custom Setting c4.

› Viewing photo information

The Df records masses of information (metadata) about every image you take. Much of this can be viewed using / to scroll through up to 9 pages of data.

To determine which pages are visible, visit **Playback display options** in the Playback menu. When you've selected the screens you want to see, scroll to **Done** and press .

Playback pages	Selection	Details
File information	Always available	Displays large image; basic file info displayed at bottom of screen.
None (image only)	Enable from Playback menu	Displays large image with no other data.
Overview	On by default; disable from Playback menu	Displays small image, simplified histogram, and summary information. Focus point used can also be shown: select using Focus point , found under Playback display options on the Playback menu.
Location data	Only appears when a GPS device was attached during shooting.	
Shooting data (3 or 4 pages)	Enable from Playback menu	Pages 1–3 are always available. Page 4 only appears when Copyright Information is recorded.
RGB histogram	Enable from Playback menu	See p88.
Highlights	Enable from Playback menu	See p88.

› Playback zoom

To assess sharpness, or for other critical viewing, you can zoom in on a section of an image.

1) Press  to zoom in on the currently selected image. Repeated presses increase the magnification. A small navigation window appears briefly, with a yellow outline indicating the visible area.

2) Use the multi-selector to view other areas of the image.

3) Rotate the main command dial to view other images at the same magnification.

4) To return to full-frame viewing, press .

Tip

High magnification—the equivalent of eight presses—appears pixelated and is of debatable value. It can give you the impression that none of your images are properly sharp! Six or seven presses should be enough, even for critical users.

› Viewing images as thumbnails



VIEWING IMAGES AS THUMBNAILS



From most screens (not Highlights), press to display 4 images; repeat to see 9 or 72 images. Scroll up and down to reveal other images. The currently selected image is outlined in yellow. To return to full-frame view, press .

› Calendar view



CALENDAR VIEW



Calendar view displays images grouped by the date on which they were taken. With 72 images displayed, press again to reach the first calendar page (Date view). The most recent date is highlighted, and pictures from that date appear in a strip at the right (the thumbnail list). Use the multi-selector to select other dates. Press again to enter the thumbnail list so you can scroll through pictures from the selected date: pressing reveals a larger preview of the selected image. Press again to return to Date view.

› Deleting images

To delete the current image, or the selected image in thumbnail view, press . A confirmation dialog appears. To proceed, press again; to cancel press . In Calendar view you can also delete all

images taken on a selected date. Highlight that date in Date view, and then press . When the confirmation dialog appears press again to delete or to cancel.

› Protecting images

To protect the currently selected image press . To remove protection, press again. Protected images can't be deleted by the previously mentioned method, but they will be deleted if you format the memory card.

› Histogram displays



RGB HISTOGRAM DISPLAY

This histogram is biased to the left, showing a preponderance of darker tones.

The histogram is a graph showing the distribution of dark and light tones in an image. For assessing whether images are exposed correctly it's far more objective than examining the image in full-frame

playback, especially in bright conditions when it's hard to see the screen image.

The overview page shows a single histogram. Checking **RGB histogram** in **Playback display options** (from the Playback menu) gives access to a detailed display showing individual histograms for the red, green, and blue color channels.

Tip

When shooting Raw, both the histogram and highlights displays are based on the embedded JPEG image. Consequently they may suggest that shadow and/or highlight detail has been lost when in fact it is perfectly possible to recover it during postproduction.

› Highlights display

The Df can display a flashing warning for areas of the image containing "clipped" highlights (completely white areas with no detail recorded in them). This is another useful and objective exposure check.



HIGHLIGHTS DISPLAY

«

This image is taken from Adobe Lightroom, where highlight clipping is shown in red; on the Df's LCD screen these areas would flash black, but this would not show up on a printed page.

AVOIDING CLIPPING

»

I wanted the clouds to appear light and bright, but at the same time it was important they didn't burn out and lose detail, so I checked the highlight display after the first shot.



The Df offers two main in-camera image adjustment and enhancement options.

First, certain settings can be applied before shooting an image (pre-shoot controls); second, changes can be made to existing images on the memory card (post-shoot options). You can access the latter options from the Retouch menu.

› Active D-Lighting

Active D-Lighting enhances the Df's ability to cope with scenes that show a wide range of brightness (dynamic range). In simple terms, it reduces the overall exposure to improve highlight capture, while midtones and shadows are boosted as the camera processes the image. Don't confuse it with the similarly named D-Lighting, which is a post-shoot option.



1) Select **Active D-Lighting** from the Shooting menu. Alternatively, access it from the Quick Settings screen.

2) From the list of options, select **Off**, **Low**, **Normal**, **High**, **Extra High 1**, **Extra High 2**, or **Auto** to determine the strength of the effect. Press **OK**. This setting will apply to all images until you reset Active D-Lighting.

Tip

Because Active D-Lighting alters the overall exposure, it is best to turn it off when shooting Raw.

› Pre-shoot controls

Many of the controls that we've already considered have obvious and direct effects in the final image: aperture, shutter speed, ISO, white balance, and many more. In addition, the Df provides other important ways to control the qualities of the image, notably Nikon Picture Controls and Active D-Lighting.

Note:

These settings apply directly to JPEG/TIFF images. When shooting Raw, they have no effect on the basic raw data. Picture Control settings can be applied as presets to Raw files when they're opened in Nikon View NX2 or Capture NX2, but other manufacturers' software will not recognize them. However, these settings do affect the appearance of review/playback images on the monitor, even when the base image is Raw.

ACTIVE D-LIGHTING

«

This shot was taken with Active D-Lighting set to **Extra High 1** (left) and switched **Off** (right). The shot with Active D-Lighting activated has a strong sky, but retains detail into the shadows; the shot with Active D-Lighting turned off loses a lot of its impact due to the bleached-out sky.

› Picture Controls

Picture Controls influence the way that JPEG/TIFF files are processed by the camera. The current Picture Control is indicated in the Information Display.

The Df offers six preset Picture Controls: **Standard**, **Neutral**, **Vivid**, **Monochrome**, **Portrait**, and **Landscape**—all fairly self-explanatory. Each has preset values for **Sharpening**, **Contrast**, and **Brightness**.

For color images, there are also settings for **Saturation** and **Hue**; the **Monochrome**

Picture Control has **Filter effects** and **Toning** instead.

You can fine tune these settings within each Picture Control, and you can also create your own custom Picture Controls.

PICTURE CONTROLS

Neutral (left) and Vivid (right).



Selecting Nikon Picture Controls

- 1) Select **Set Picture Control** from the Shooting menu. Alternatively, access it from the Quick Settings screen.
- 2) Highlight the required Picture Control and press **OK**. This Picture Control will apply to all images you shoot until the setting is changed again.

Modifying Picture Controls

You can modify the existing Picture Controls in camera.

- 1) Select **Set Picture Control** from the Shooting menu.
- 2) Highlight the required Picture Control and press **►**.
- 3) Use **▲ / ▼** to select **Quick Adjust** or one of the specific parameters. Use **◀ / ▶** to change the value as desired.
- 4) When all parameters are as required, press **OK**. The new values are retained until you modify that Picture Control again, or carry out a two-button reset.

Creating custom Picture Controls

You can create up to nine additional Picture Controls, either in-camera or using View NX2's Picture Control Utility. Custom Picture Controls can also be shared with other Nikon DSLRs. For further details see the Help menu in Picture Control Utility.

Creating custom Picture Controls in-camera

- 1) Select **Manage Picture Control** from the Shooting menu.
- 2) Select **Save/edit** and press **►**.
- 3) Highlight an existing Picture Control and press **►**.
- 4) Modify the Picture Control as described previously. When the parameters are set as required, press **OK**.
- 5) On the next screen, give the new Picture Control a name. By default, the name derives from the existing Picture Control on which it is based, plus a 2-digit number (**VIVID-02**, for example), but you can give your custom Picture Control a new name, up to 19 characters long.
- 6) Press **OK** to store the Picture Control.

› HDR (high dynamic range) images

“Contrast,” “dynamic range,” and “tonal range” all refer to the range of brightness between the brightest and darkest areas of a scene. Our eyes adjust continuously, allowing us to see detail in both bright areas and deep shade. By comparison, even the best cameras often fall short, losing detail (“clipping”) in shadows, highlights, or even both.

Shooting Raw gives some chance of recovering highlight and/or shadow detail in postproduction, while Active D-Lighting or D-Lighting can help with JPEG images. However, all of these have their limits. Sometimes it’s simply impossible to capture the entire brightness range of a scene in a single exposure. Both the histogram display and the highlights display help to identify such cases.

HDR

An HDR image and two (simulated) source frames: the exposure differential was 3 stops.



When this happens, one solution is to make more than one exposure and then combine the results. The Df can automate this, creating a high dynamic range JPEG image by merging two separate shots taken at different exposures (one biased toward the shadows and the other toward the highlights).

You can take this process even further by using HDR software on the computer (I use the LR/Enfuse plugin for Adobe Lightroom), or merging images manually: I find Photoshop's Layer Masks the best tool for this.

1) Select HDR (high dynamic range) from the Shooting menu (note that this is unavailable if **Image quality** is set to **NEF (RAW)** or **NEF (RAW)+JPEG**). Select **HDR mode** and press ►.

2) Select On (series) to take a series of HDR images. Select **On (single photo)** to take just one. A **HDR** icon appears in the viewfinder.

3) Choose the Exposure differential between the two source images. **Auto** allows the camera to determine this automatically, or you can select **1EV**, **2EV**, or **3EV**.

4) Choose the Smoothing level. This influences the blending between the two source images. If bright or dark "halos" appear in the final image, try again with a higher smoothing level.

5) Shoot as normal. The camera will automatically shoot two images in quick succession. It then takes a little time to combine them and display the results. During this time, **Job Hdr** flashes in the viewfinder and you can't take further shots.

6) If you selected On (series) at step 2, HDR shooting continues until you visit the menu again to cancel it. If you selected **On (single photo)**, it's cancelled automatically.

Tip

HDR works well for static subjects, but as there's a slight delay between the two exposures the results can be unsatisfactory when there's movement in the scene. In this situation you may have to look for an alternative answer, such as using fill-in flash.

2

» EXPOSURE CHALLENGE

This image presented some demanding light. With the sun in the frame the camera could easily have been fooled into underexposing. At the same time, there were a lot of deep shadows, which may have tipped it in the direction of overexposure. I didn't even try to guess which way it would go: I just took a test shot and looked at the histogram. My main concern was to preserve detail in the shadows and the brightest areas of the sky (I knew the sun itself would "burn out").

Settings

- › Focal length: 24mm
- › Aperture: f/11
- › Shutter speed: 1/250 sec.
- › ISO: 400

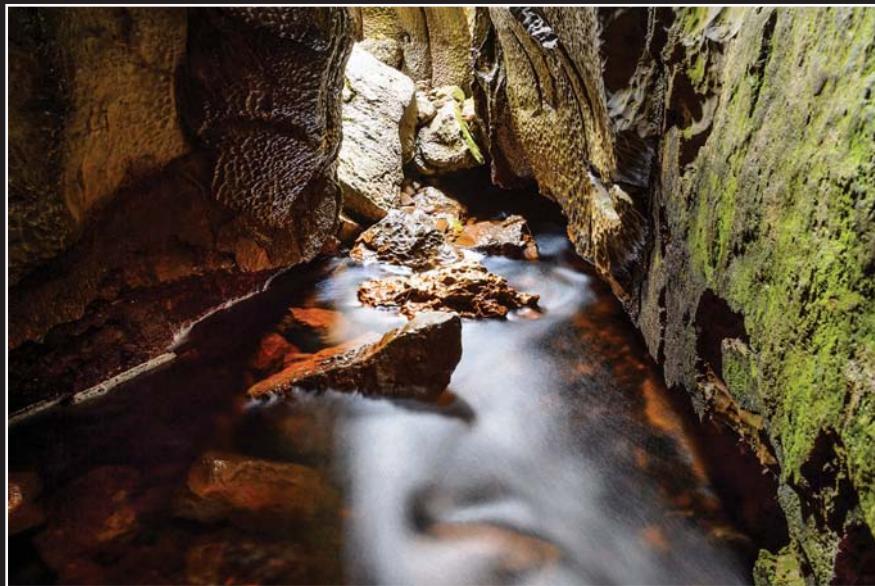


» DYNAMIC RANGE

This shallow cave offered some challenges, including squeezing myself and my tripod into its narrow confines! Even with a high ISO I would have needed a tripod, so I set the ISO to 100 instead to maximize dynamic range. I looked carefully at the histogram and highlights display after the first attempt and doubled the exposure time for this shot (with the shutter speed dial on T). There are tiny patches of highlight clipping on the damp rocks and in the water, but nothing I can't live with.

Settings

- › Focal length: 24mm
- › Aperture: f/16
- › Shutter speed: 60 sec.
- › ISO: 100



3 MENUS

The options accessed through dials and buttons are just the beginning. There are many more ways in which you can customize the Df to suit you, but these are only revealed when you delve into the menus.

The Nikon Df has six menus: Playback, Shooting, Custom Setting, Setup, Retouch, and My Menu/Recent Settings.

The Playback menu, outlined in blue, covers functions relating to playback, including viewing and deleting images.

The Shooting menu, outlined in green, is used to control shooting settings, such as ISO, white balance, and Active D-Lighting. As we've already seen, many of these can be accessed by other means.

The Custom Setting menu, outlined in red, allows you to fine tune and personalize many aspects of the camera's operation.

The Setup menu, outlined in orange, governs a range of functions such as LCD brightness, plus others that you may need to change only rarely, such as language and time settings.

The Retouch menu, outlined in purple, allows you to create modified copies of images on the memory card.

Finally, Recent Settings, outlined in gray, handily stores options from other menus that you have used. It can also become My Menu, in which you decide exactly which items to collect.

› Navigating the menus

- 1) To call up the main menu screen press the **MENU** button.
- 2) Use **◀/▶** to highlight the different menus. To enter the desired menu press **►**.
- 3) Use the multi-selector to highlight specific menu items; press **►** to select an item. In most cases this will take you to a further set of options.
- 4) Use the multi-selector to choose the desired setting and press **►** or **OK** to select it. In some cases you may need to scroll up to **Done** and then press **OK** to make changes effective.
- 5) To return to the previous screen, press **◀**. To exit the menus completely, without affecting any changes, half press the shutter-release button.

» THE PLAYBACK MENU



THE PLAYBACK MENU

The Playback menu contains options affecting how images are viewed, stored, deleted, and printed. Most of its items are only accessible when a memory card (with images) is present in the camera.

› Delete

This function allows images to be deleted, either singly or in batches.

1) Select the Playback menu, highlight **Delete**, and press **►**.

2) In the menu options screen, choose **Selected**, **Date**, or **ALL**.

3) If you choose **Selected**, images in the active playback folder or folders are displayed as thumbnail images. Use the multi-selector to scroll through the displayed images. Press and hold **OK** to view the highlighted image full-screen. Press **Q** to mark the highlighted shot for deletion. It will be tagged with a **W** icon. If you change your mind, highlight a tagged image and press **Q** to remove the tag. Repeat this procedure to select further images. (To exit without deleting any images, press **MENU**.) Press **OK** to see a confirmation screen. Select **YES** and press **OK** to delete the selected image(s); to exit without deleting any images, select **NO**.

4) If you choose **Date**, you'll see a list of dates on which images on the memory card were taken. Use **▲** / **▼** to scroll through the list and press **►** to mark a date for deletion. It will be checked in the list. If you change your mind, highlight the date and press **►** again to remove the tag. Repeat this procedure to select further dates. Press **OK** to see a confirmation screen. Select **YES** and press **OK** to delete all image(s) taken on the selected date(s), or to exit without deleting any images, choose **NO**.

Tip

Individual images can also be deleted from the normal playback screen (see page 87); this is usually more convenient.

› **Playback folder**

By default, the playback screen will only display images in the current folder. For most of us there is only ever one folder on the memory card, so this is of no significance. However, if you're one of the few who does end up with multiple folders, this menu allows you to view images in all folders. If the memory card contains images that were taken on another Nikon camera, it can enable you to see those too.

› **Hide image**

Hidden images can only be seen through this menu. These images are protected from deletion, but will be lost when you format the memory card.

1) Open the Playback menu, highlight **Hide image**, and press ►.

2) Choose **Select/set**. Images in the active playback folder or folders are displayed as thumbnails. (You can also **Select date** to hide all images from a specific date.)

3) Use the multi-selector to scroll through the displayed images. Press and hold ☰ to view the highlighted image full-screen. Press ☒ to mark the highlighted shot as hidden. It will be tagged with a  icon. If you change your mind, highlight a tagged image and press ☒ to remove the tag.

4) Repeat this procedure to select further images and press **OK**. To exit without hiding any images, press **MENU**.

Playback folder options

NC_DF (default) Displays images in all folders created by the Df.

All Displays images in all folders, including those created by other Nikon cameras.

Current Displays images in the current folder only.

› Playback display options

This is an important menu as it enables you to choose what (if any) information about each image will be displayed on playback, over and above the bare-bones info screen that is always available. These options were described on pages 85–86.

› Image review

If **Image review** is **On**, the latest image is displayed automatically on the monitor immediately after shooting. If **Off**, images are only displayed when you press . If you're looking to economize on battery life, choose **Off**.

› After delete

Determines “what happens next” after an image is deleted (in normal playback, not via the Delete menu). **Show next** means that the next image in the order of shooting will be displayed; **Show previous** means that the previous image in the order of shooting will be displayed; **Continue as before** means that the next image to be displayed is determined by the order in which you were viewing images before deleting (so if you were scrolling back through the sequence, the previous image will be displayed, and vice versa).

› Rotate tall



ROTATE TALL OFF AND ON

This determines whether portrait format (“tall”) images are displayed “right way up” during playback/image review. If set to **Off** (the default setting), these images will not be rotated, meaning that you need to turn the camera through 90° to view them correctly. If **Rotate tall** is set to **On**, these images will be orientated correctly. Because the monitor screen is rectangular, they will appear smaller.

› Slide show

This enables you to display images as a slide show, either on the camera's LCD screen or on a connected TV. All images in the folder or folders selected for playback will be played in chronological order.

- 1) Make sure that playback is set to **Image only** to ensure an uncluttered slide show.
- 2) Select **Slide show** from the Playback menu.
- 3) Select **Frame interval**. Choose between **2, 3, 5, or 10** seconds. Press **OK**.
- 4) Select **Start** and press **OK**.
- 5) When the show ends, a dialog screen is displayed. Select **Restart** and press **OK** to play again. Select **Frame interval** and press **OK** to return to the Frame interval dialog. Select **Exit** and press **OK** to exit.
- 6) If you press **OK** during the slide show, the slide show is paused and the same screen displayed. The only difference is that if you select **Restart** and press **OK**, the show will resume where it left off.

› DPOF print order

This allows you to select JPEG image(s) to be printed when the camera is connected to, or the memory card is inserted into, a printer that complies with the DPOF (Digital Print Order Format) standard.

- 1) From the Playback menu, highlight **Print set (DPOF)** and press **►**. Choose **Select/set**. Images in the current playback folder will be displayed as thumbnails.
- 2) Use **◀ / ►** to scroll through the images. Press and hold **Q** to view the highlighted image full-screen.
- 3) Press **▲** to select the image to be printed as a single copy. It will be tagged with a  icon and the number 01. To print more than one copy press **▲** as many times as necessary.
- 4) Repeat this procedure to select further images. When all desired images have been selected, press **OK**.
- 5) From the confirmation screen select **Print shooting data** if you wish the shutter speed and aperture to be shown on all pictures printed. Select **Print date** if you wish the date of the photo to be shown. When you're ready to confirm the order, press **OK**.

» THE SHOOTING MENU



THE SHOOTING MENU

The Shooting menu contains numerous options, but many of these are also accessible through other means and have already been discussed.

› Shooting menu bank

This is a handy way to store particular combinations of Shooting menu settings that you use repeatedly. This saves having to make all those changes individually. For instance, I might create a “Landscape” menu bank that sets **Image Quality** to **NEF (RAW)**, **NEF (RAW) recording** to **14-bit**, **White Balance** to **Direct Sunlight**, and **ISO setting** to **100** (my usual settings for landscape photography). I can then activate this menu bank to quickly set the camera to all of these parameters. You can create up to four menu banks for different shooting requirements.

To create a Shooting menu bank

1) In the Shooting menu, select **Shooting menu bank** and press **OK**.

2) Select one of the four available banks (by default named **A**, **B**, **C**, and **D**) and press **OK**. The normal Shooting menu screen now appears. If Shooting menu bank A has not been used previously it will show the current settings; the others remain at default settings until used. Work down the menu, making any desired changes to settings, and then exit by pressing **MENU**. If desired, rename the selected bank.

Renaming Shooting menu banks

1) Select **Shooting menu bank** from the Shooting menu and press **OK**.

2) Select **A**, **B**, **C** or **D**, and press **▶**.

3) A “keyboard” now appears. Navigate around this using the multi-selector. To use the highlighted character press **OK**. To make corrections, move the cursor by holding **Q** and then pressing **◀** or **▶** to position the cursor, then press **W** to delete a character from the string. Names can be no more than 20 characters long.

4) To exit and save the new name press **⊕**. To exit without saving, press **MENU**.

Note:

Shooting menu banks are still shown by the letters A, B, C, and D in the main Shooting menu screen, but new names will be shown in the Shooting menu bank menu.

To use a Shooting menu bank

- 1)** Select **Shooting menu bank** from the Shooting menu and press **OK**.
- 2)** Highlight one of the four available banks and press **OK**.

Storage folder

By default, the Df stores images in a single folder (named 101NC_DF). If multiple memory cards are used they will all end up holding folders of the same name. This isn't usually a problem, but some people might wish to avoid it. You might also want to create specific folders for different shoots or different types of image. Because this item is in the Shooting menu, it can be linked to Shooting menu banks. For example, a "portrait" Shooting menu bank might link to one folder, a "landscape" Shooting menu bank to another folder, and so on.

The camera will automatically create a new folder when the current one becomes full. In this context, "full" means it contains 999 images. If you download to your

computer regularly and then format the card for re-use, this may never happen, but it is a possibility if you are a very prolific shooter or you're traveling for long periods without access to a computer. In this case you may prefer to create a series of folders, perhaps organized by location or date.

To create a new folder number

- 1)** In the Shooting menu, select **Storage folder** and press **OK** or **▶**.
- 2)** Choose **Select folder by number** and press **OK** or **▶**.
- 3)** By default, the next screen shows the first available number: press **OK** to create the new folder and return to the Shooting menu. If you want to set another number, press **◀ / ▶** to highlight a digit and **▲ / ▼** to change it. If the indicated number is already in use, a folder icon appears and a new folder will not be created.
- 4)** When the screen shows the number you want to use press **OK** to create the new folder and return to the Shooting menu. Your new folder automatically becomes the active folder.

To switch between existing folders

- 1) Enter the Shooting menu, select **Storage folder**, and press **OK** or ►.
- 2) Choose **Select folder from list** and press **OK** or ►. Scroll through the list to the folder you want to use and press **OK**. To exit without making a change, press **MENU**.

› File naming

By default, if **Color space** is set to **sRGB**, the name begins **DSC_**; if **Color space** is set to **AdobeRGB**, the name begins **_DSC**. In both cases this is followed by a 4-digit number and a 3-letter extension (.JPG for JPEG files, .TIF for TIFF files, and .NEF for Raw files). You can edit the initial 3-letter string if you wish. You might, for instance, replace it with your initials, so that instead of files being **DSC_4567.JPG** they could be **CJS_4567.JPG**.

To edit the file-naming string

- 1) In the Shooting menu, select **File naming** and press **OK**.
- 2) Select **File naming** from the next menu, and press **OK**.
- 3) Edit the 3-digit string, using the multi-selector and on-screen “keyboard” as described previously.

- 4) Press **OK** to accept the new name, or press the **MENU** button to exit without making the change.

› Image quality

Use this to choose the file type (Raw, TIFF, or JPEG), as described on page 70.

› Image size

Allows you to choose between **Small**, **Medium**, and **Large** image sizes, as described on page 72. If you are shooting Raw, this item cannot be accessed (Raw files are always recorded at maximum resolution).

› Image area

Use this to choose between **FX** and **DX** image areas, as described on page 71.

› JPEG compression

Determines how JPEG files are compressed. **Size priority** means that all images are reduced to a set size (dependent on the options selected for Image area, Image quality, and Image size). **Optimal quality** means that image sizes are allowed to vary, allowing for better file quality.

› NEF (RAW) recording

This menu offers two sets of options governing how Raw files are recorded. **NEF (RAW) bit depth** allows you to switch

between **12-bit** and **14-bit** depth, while selecting **Type** allows you to choose one of three types of Raw file compression:

Lossless compressed (default)

Files are compressed by about 20–40%, with no detectable effect on image quality.

Compressed

Files are compressed by around 40–55%, with a very small effect on image quality.

Uncompressed

Files are not compressed. Uncompressed files take up more memory card space and write times are slightly increased.



RAW

Shooting in 14-bit Raw captures the maximum amount of information, giving you the best chance of achieving the desired result, even with the most challenging shots.

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› White balance

Allows you to set the white balance, as discussed on page 76.

› Set Picture Control and Manage Picture Control

Govern the use of Nikon Picture Controls (see page 92).

› Color space

Allows you to choose between **sRGB** and **Adobe RGB** color spaces (see page 77).

› Auto distortion control

If set to **On**, this automatically corrects for distortions that may arise with certain lenses. It's available only with D-type and G-type lenses, excluding fisheye and PC (perspective control) lenses.

Tip

*When using DX lenses, make sure that **Auto DX crop** is **On**, or **Image area** is set to **DX**; otherwise **Auto distortion control** may produce undesirable results.*

› Vignette control

Vignetting is a darkening, or fall-off in illumination, toward the corners of the image, which shows up most clearly in even-toned areas such as clear skies.

Almost all lenses have a slight tendency to introduce vignetting at maximum aperture, but this usually disappears when the lens is stopped down. The Df is able to compensate for vignetting in-camera, while processing TIFF and JPEG images. Use this menu to choose between **Normal** (the default setting), **High**, **Low**, and **Off**.

Note:

Vignette control only operates when D-type or G-type lenses are attached. It does not work with DX lenses, or when shooting with the **Image area** set to **DX**. It also does not apply when shooting multiple exposures.

› Active D-Lighting

This menu allows you to set Active D-Lighting, as discussed on page 90.

› HDR (high dynamic range)

Enable and control HDR shooting, as described on page 94.

› Long exp. NR

Photographs taken at long shutter speeds can be subject to increased “noise.” The Df is one of the best cameras available for keeping noise to a minimum, but no camera is completely immune. There is therefore the option of extra image processing to counteract noise.

If **Long exposure noise reduction** (its full name) is **On**, it applies noise reduction to images taken using exposure times of 1 second or longer. During the processing, **Job nr** flashes in the viewfinder display. The time taken is roughly equal to the shutter speed in use, and no further pictures can be taken until processing is complete. This causes significant delays in shooting and many users prefer to reduce image noise during postproduction. For this reason, **Long exp. NR** is **Off** by default.

› Auto ISO sensitivity control

Sets the options for Auto ISO, as discussed on page 59.

› High ISO NR

Photographs taken at high ISO settings can also be subject to increased “noise,” which is where **High ISO NR** (noise reduction) comes in. The default setting is **Normal** but this can be changed to **Low** or **High**. It can also be set to **Off**, although even then a small amount of noise reduction is applied to images taken at ISO 3200 or above.

Tip

Too much noise reduction can blur detail and give images a “plastic” quality. This is often very obvious if you look closely at high ISO images taken with compact cameras and smartphones. The Df is far less susceptible to this, but noise reduction is still best applied with caution as it’s “baked” into JPEG and TIFF files. Once there, it is virtually impossible to restore any of the lost texture or detail. Unless you’re in a hurry, it’s better to apply noise-reduction during postproduction, when you can see the effect more clearly and back off if necessary.

› Multiple exposure

When you can merge images on the computer, precisely and flexibly, it might seem that cameras like the Df hardly need a multiple exposure facility.

However, the Nikon manual states that in-camera multiple exposures "produce colors noticeably superior to those in software-generated photographic overlays." It's debatable whether this would apply if you shot individual Raw images for careful postproduction before merging them on a computer, but clearly this feature offers an effective way to combine images for immediate use (as JPEG files for printing, for example).

Notes:

Auto gain (set to **ON** by default) adjusts the exposure, so that if you are shooting a sequence of 3 shots, each is exposed at $\frac{1}{3}$ the exposure value required for a normal exposure. You might turn Auto gain **OFF** where a moving subject is well lit but the background is dark, so that the subject is well exposed and the background isn't over-lightened.

Normally the maximum interval between shots is 30 seconds. This can be extended by setting a longer standby time in Custom Setting c2.

Multiple exposure can be combined with the Interval timer facility to make the exposures at set intervals.

To create a multiple exposure

1) Select **Multiple exposure** from the Shooting menu and press **►**.

2) Select **On (series)** to take a series of multiple exposures. Select **On (single photo)** to take just one.

3) Select **Number of shots**, use **▲ / ▼** to choose from **2** to **10**, and then press **OK**.

4) Select **Auto gain**, choose **ON** or **OFF**, and then press **OK**.

5) Select **Done** and press **OK**.

6) Frame the first photo of the sequence and shoot normally. Note that you must use the viewfinder, not Live View. If the release mode is **C1** (Continuous Low) or **C_H** (Continuous High), the designated images will be exposed in a single burst. In Single Frame release mode, one image in the sequence will be exposed each time the shutter-release button is pressed.

7) If you selected **On (series)** at Step 2, you'll need to return to this step and select **Off** when you've finished multiple exposure shooting.

› Interval timer shooting

The Df can take a number of shots at pre-determined intervals. If Multiple exposure is activated first, they will be combined into a single image; otherwise they will be recorded individually.

1) Highlight **Interval timer shooting** on the Shooting menu and press **►** or **OK**.

2) Choose a start time. If you select **Now**, shooting begins 3 seconds after you complete the other settings, and you can skip Step 3. To set a later starting time, select **Start time** and press **►** to continue to the next step.

3) Use **◀ / ►** to select hours or minutes. Use **▲ / ▼** to select the time (in the next 24 hours). Press **►** to continue.

4) Choose the interval between shots. Use **◀ / ►** to select hours, minutes, or seconds. Use **▲ / ▼** to change these values and then press **►** to continue.

5) Choose the number of intervals (up to 999) and the number of shots to be taken at each interval (up to 9). The total number of shots this amounts to is also displayed. Press **►** to complete the setup and reach the primary Interval timer shooting screen.

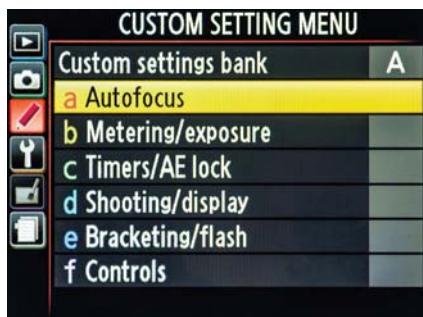
6) Highlight **Start > On** and press **OK**.

Notes:

If you're planning a large number of shots and/or have long intervals between them, make sure that the camera's battery is fully charged or the camera is connected to a mains power supply.

You should also make sure that there is sufficient space on the memory card—if the card becomes full during an Interval timer sequence, shooting stops until the card is replaced.

» THE CUSTOM SETTING MENU



THE CUSTOM SETTING MENU



The Custom Setting menu allows almost every aspect of the camera's operation to be fine tuned to your personal preferences. The menus are divided into seven main groups, identified by key letters and a color: a: Autofocus (red); b: Metering/exposure (yellow); c: Timers/AE lock (green); d: Shooting/display (light blue); e: Bracketing/flash (dark blue); and f: Controls (lilac). In addition there are options to create Custom Settings banks.

To choose a Custom Setting

- 1) Press **MENU**. If another menu appears first, press **◀** to highlight the icons shown in the left column and scroll up or down to the Custom Setting menu icon. Press **▶** to enter the Custom Setting menu.
- 2) Use the multi-selector to scroll up or down the desired settings group. Press **▶** to display the group.
- 3) Use **▲** / **▼** to scroll up or down to the desired settings. Press **▶** to display the options for that setting.
- 4) Highlight the desired option and press **OK** to select it.

Notes:

Although the settings are organized into seven groups, they appear as a continuous list, so you can scroll straight on from a8 to b1 and so on. If you scroll in the other direction you can go from a1 to g4.

The Custom Setting identifier code is shown in the appropriate color for that group. If the setting has been changed from default values, an asterisk appears over the initial letter of the code.

› Custom Settings banks

Analogous to the Shooting menu banks discussed on page 103, this is a handy way to store particular combinations of Custom Settings that you may use repeatedly. You can create up to four menu banks for different shooting requirements. The procedure for creating and renaming Custom Settings banks is exactly the same as that for Shooting menu banks, except that you start the process from the Custom Setting menu.

Restoring default settings

To restore the current Custom Settings bank to standard camera default values, highlight that menu bank then press . A confirmation dialog appears—select **Yes** and press to confirm.

› a: Autofocus

a1 AF-C priority selection and a2 AF-S priority selection

Normally, in AF-C (Continuous) release mode, the camera can take a picture even if it has not acquired perfect focus (**Release priority**). Custom Setting a1 allows you to choose **Focus priority** instead, so pictures can only be taken once focus is acquired.

Custom Setting a2 allows you to change the priority setting for AF-S (Single-servo AF), but here the default is **Focus priority**.

a3 Focus tracking with lock-on

This governs how rapidly the camera reacts to sudden large changes in the distance to the subject (or what it deems to be the subject). If this is **Off**, the camera reacts instantly to such changes, but this means it can be fooled when other objects pass in front of the intended subject. Longer delays reduce its sensitivity to such intrusions. Options run from **5 (Long)** via **3 (Normal)** (the default setting), to **1 (Short)**, as well as **Off**.

a4 AF activation

Normally, autofocus can be activated either by half pressure on the shutter-release button (this will be familiar to almost all SLR users) or by the **AF-ON** button. This remains the default setting, tagged **Shutter/AF-ON**, but you can also choose **AF-ON only**, which means the shutter-release button no longer activates the camera's AF system.

a5 Focus point illumination

This determines whether the active focus point is illuminated in red in the viewfinder. If not illuminated, it's outlined in black instead. The default is **Auto**, which means the focus point is only illuminated when this will give better contrast with the background. Alternatively, it can be set to be permanently **On** or **Off**. A second submenu (labeled **Manual focus mode**)

determines whether or not the active focus point is visible when shooting in manual focus. If you think it's irrelevant and possibly distracting to see AF points when using manual focus, it's easy to turn them **Off**. However, there is at least one situation when the AF point is relevant to manual focusing—when you are using the electronic rangefinder (see page 65).

a6 Focus point wrap-around

This governs whether the active focus point wraps to the opposite edge of the available area. The options are **Wrap** or **No wrap** (default).

a7 Number of focus points

This governs the number of focus points that you can choose from when selecting the focus point manually (see page 66). By default the full 39 points are used (**AF39**), but you can also opt to use 11 points (**AF11**). Using the smaller number can speed up the selection process.

Note:

Even when you select **AF11**, the camera still uses all 39 points for automatic selection, focus tracking, and so on.

› b: Metering/exposure

b1 Center-weighted area

This determines the diameter of the main area used by the Df's center-weighted metering pattern. The options are **8mm**, **12mm** (default), **15mm**, **20mm**, and **Average**. **Average** means that the metering is based equally on the entire frame. With non-CPU lenses only **12mm** and **Average** are available.

b2 Fine tune optimal exposure

This enables a form of permanent exposure compensation that allows you to apply separate exposure adjustments for each of the three main metering methods (matrix, center-weighted, and spot) in $\frac{1}{6}$ EV increments, up to ± 1 EV.

Usually, the standard compensation procedure is preferable, but this option could be useful for specific needs. You might, for example, prefer your portraits to have a consistently lighter feel, so could fine tune the center-weighted setting for this purpose.

You will need to remember that this compensation is in operation, though, as the normal exposure compensation indicator will not be displayed. In fact, every time you access this menu item, you'll see a reminder of exactly this issue: you need to select **Yes** and press **OK** before going any further.

c1 Shutter-release button AE-L

This determines whether you can lock exposure by half pressure on the shutter-release button. By default, this is **Off**, and half pressure locks focus only. In this case, you can only lock exposure with the **AE-L/AF-L** button.

c2 Standby timer

This sets the interval before the exposure meter turns off when the camera is idle. A shorter delay is good for battery life.

The default is **6 secs**; other options range from **4 secs** up to **30 mins**. There's also **No limit**, which means the meter remains active until you turn the camera off. This applies automatically if the Df is connected to a mains adapter.

c3 Self-timer

This menu has three submenus governing the operation of the Self-timer (position  on the release mode dial).

Self-timer delay determines the interval between pressing the shutter-release button and the shot being taken. The default is **10 secs**, alternatives are **2, 5, and 20 secs**.

As well as taking a single shot, you can create sequences from one press of the release button. **Number of shots** can be set anywhere from **1** to **9**, and **Interval between shots** can be set to **0.5, 1, 2, or 3 secs**. (Note that this only affects the delay after the first shot; the delay before the first shot in a sequence is still determined by **Self-timer delay**).

**SELF-TIMER SEQUENCE**

When I'm walking or biking on my own I may still need "action" shots and will keep an eye out for opportunities to use the self-timer. It's easier when I have a tripod with me, but there are usually places to set a camera. Here the old quarry buildings provided several possible platforms, while shooting nine frames at 0.5-second intervals meant there was a reasonable chance that at least one would be worth keeping.

Tip

I've found self-timer sequences for capturing action shots very handy when walking or cycling on my own. Although they don't allow for critical timing of action shots, they can greatly increase your chances of getting a reasonable result. In most cases I'll set the interval to 0.5 sec.

c4 Monitor off delay

This determines how long the LCD monitor screen remains illuminated when the camera is idle. Shorter delays are, of course, good for battery economy. Options range from **4 secs** to **10 mins** and you can set them individually for **Playback**, **Menus**, **Information display**, **Image review**, and **Live view**. It's not hard to see that you might want the screen to remain active for longer when using Live View than when visiting the menus, for example.

For most of the headings the longest delay you can set is **10 minutes**, but this is the default for Live View, where you can range from **5 minutes** to **30 minutes**.

There's also a **No limit** setting, which means the Live View display can remain on for as long as the camera has power.

› d: Shooting/display

d1 Beep

If you wish, the camera can emit a beep when the self-timer operates, and to signify that focus has been acquired when shooting in single-servo AF mode. This is **Off** by default, but you can choose a **High** or **Low** pitch for the beep instead.

d2 Viewfinder grid display

Allows the camera to display grid lines in the viewfinder, which can help you keep the camera level and may assist with precise framing. They can also alert you to a lens that is delivering visible distortion. The options are **Off** (default) and **On**. It's a personal choice, but I always enable the grid on any camera I'm using.

d3 ISO display

With this option set to **Off** (the default setting) the figure at bottom right of both the LCD screen and the viewfinder display shows how many more exposures can be accommodated on the memory card at the current Image Size/Area/Quality settings. When you half press the shutter-release button, the figure changes to show the maximum number of frames that can be captured in a single burst with the current settings.

By setting **ISO display** to **On**, you can choose to display the current ISO sensitivity setting instead. As ISO is such an important

factor in exposure I like to have this constant reminder of the current setting when the camera is at my eye, and so my normal practice is to set this menu to **On**. However, you could argue that it's less crucial with the Df than other Nikon DSLRs as the ISO dial on the top-plate gives an at-a-glance reminder of the current ISO, even when the camera's switched off!

d4 Screen tips

Allows the camera to display pop-up "labels" to help identify items you have selected in the Information Display. Options are **On** (default) and **Off**.

d5 CL mode shooting speed

This governs the frame rate when using **Cl** (Continuous Low) or **Ch** (Continuous High) release mode. The default is **3fps** (frames per second), with options running from **1fps** to **5fps**. Setting **5fps** would make **Cl** almost identical to **Ch** (5.5fps).

d6 Max continuous release

Determines the maximum number of shots that you can take in a single burst when using either of the continuous release modes (**Cl** or **Ch**). The camera is limited to 100, but you can set a lower limit using the multi-selector. You can even go all the way down to 1 if you wish, although this seems slightly unnecessary—if you just want to take a single shot why would you select a continuous release mode in the first place?

In practice, the buffer often proves to be a limiting factor on the length of continuous bursts. For example, when shooting Raw or TIFF format images and/or if you are using a relatively slow memory card you will find the maximum burst is significantly lower than 100 frames.

d7 File number sequence

This controls how image numbers are set. Set to **Off**, file numbering is reset to 0001 whenever you insert a new memory card, format an existing card, or create a new storage folder. Set to **On** (the default setting) numbering continues from the previous highest number used. **Reset** creates a new folder and begins numbering at 0001.

d8 Information display

Determines how shooting information is displayed on the monitor: the Information Display can switch from **Light on dark** to **Dark on light** to give a clearer readout in different lighting conditions. By default (**Auto**), the camera does this automatically, but you can choose **Manual** and then press ► to apply **Light on dark** or **Dark on light** at all times.

d9 LCD illumination

This governs illumination of the control panel on the camera's top-plate. If it's **On**, the control panel will be illuminated whenever the exposure meter is active.

If **Off** (the default setting), the control panel is only illuminated when you press the  button. Leaving this setting **Off** will save a little battery life, although it's unlikely that the Df's tiny control panel use a huge amount of power.

d10 Exposure delay mode

You can use this setting to create a short delay when you press the shutter-release button. This is a possible alternative to the self-timer or mirror-up release mode to reduce vibration when shooting on a tripod. **Exposure delay mode** is **Off** by default, or you can opt for **1s**, **2s**, or **3s**.

e: Bracketing/flash

e1 Flash sync speed

Determines the fastest flash sync speed. Settings run from **1/200s** (the default) down to **1/60s**.

In addition there are settings of **1/250s** (**Auto FP**) and **1/200s (Auto FP)**. These only apply when certain auxiliary Nikon flash units are attached, in which case flash sync is possible at any speed. If other flash units are attached the sync speed remains limited to 1/250 sec. or 1/200 sec.

e2 Flash shutter speed

While the previous option controls the fastest shutter speed that can be used with flash, this one determines the slowest shutter speed that the camera can set

when using **P** or **A** exposure modes. The options run from **1/60s** (default) to **30s** in increments equal to 1 stop. When using **M** or **S** exposure modes, any speed down to 30 seconds can be set.

e3 Optional flash

This menu allows you to choose a flash control mode when certain Nikon Speedlights (SB-400 or SB-300) are attached. The options are **TTL** (default), which means that flash output is regulated automatically by the camera's metering system, and **Manual**. If you select **Manual** you can then press ► to access a submenu that lets you determine the strength of the flash. With Speedlights other than the SB-400 or SB-300 this menu is not needed as you have all of this control (and usually more) through the flash itself.

e4 Exposure comp. for flash

Determines how exposure compensation operates when flash is active. If **Background only** is selected, the compensation setting only affects the ambient exposure (the aperture and/or shutter speed) and the flash output is unchanged.

If **Entire frame** is selected (which is the default), the flash output is also increased or reduced by the same amount.

e5 Modeling flash

This applies when a compatible flash unit is attached. If **Modeling flash** is **On** (which is the default setting), the flash can emit a pre-flash when you press the depth of field preview button. This gives some indication of the flash effect, and although it's limited it can give you an indication of where the shadows fall. In general, though, taking a test shot and reviewing it on the LCD screen is much more informative.

e6 Auto bracketing set

Bracketing means taking a sequence of shots while varying certain settings, most commonly those relating to exposure (see p56). The options are: **AE & flash** (default), **AE only**, **Flash only**, **WB bracketing**, and **ADL bracketing**.

e7 Auto bracketing (Mode M)

Determines which settings are bracketed when using Manual mode. It only applies when **AE & flash** or **AE only** is selected in Custom Setting e6. If **AE only** is selected, or there's no flash in use, then the first three settings allow the camera to bracket exposures by varying the shutter speed from your chosen setting (**Flash/speed**); by varying both shutter speed and aperture (**Flash/speed/aperture**); or by varying the aperture only (**Flash/aperture**).

For example, if you're shooting a landscape and want a certain aperture to ensure sufficient depth of field, you can

select **Flash/speed**. The camera will then bracket by varying the shutter speed, while keeping the aperture the same.

Tip

If you shoot a lot of bracketed sequences in Manual mode, Auto bracketing (Mode M) may prove useful, but for occasional bracketing it's just as quick to vary the shutter speed or aperture yourself. If the metered exposure is 1/125 sec. at f/11, a 3-shot bracket at 1EV intervals only requires a couple of clicks on the shutter speed dial or main command dial to give speeds of 1/60 sec. and 1/250 sec. as well.

e8 Bracketing order

Following on from the previous setting, this determines the order in which auto bracketed exposures are taken. By default, the first exposure is taken at the metered exposure (**MTR> under> over**). The alternative (**Under> MTR> over**) places the metered exposure in the middle of the sequence. To me this seems more logical.

› f: Controls

f1 button

By default, this option is set to **LCD backlight**. This means that the  button simply illuminates the top-plate control panel. Alternatively, you can opt for **both** and **information display**. This means that pressing  both illuminates the top-plate control panel and activates the Information Display on the rear monitor.

f2 button

The  button, at the center of the multi-selector, has a range of uses. This menu determines the functions it can perform in normal shooting, in playback, and in Live View. Most of the options are reasonably self-explanatory, but **Zoom on/off** probably needs a little more explanation,

especially as it is potentially one of the most useful of these functions.

In normal playback, you need to press the  button eight times to zoom in on an image to the maximum possible extent. Selecting **Zoom on/off** allows you to zoom with a single press (with a second press returning you to full-frame playback).

There's a further choice between **Low**, **Medium**, and **High magnification**. High equates to the full eight presses (which makes the image appear pixelated), while Medium equates to six presses, making it the obvious choice. The zoom display centers on the focus point that was active when the picture was taken. The **Zoom on/off** option works in the same way in Live View.

Custom setting f2: button

Shooting mode	Select center focus point (default) Highlight active focus point Not used
---------------	---

Playback mode	Thumbnail on/off (default) View histograms Zoom on/off Choose folder
---------------	---

Live View	Select center focus point (default) Zoom on/off Not used
-----------	--

f3 Multi selector

This enables you to reactivate the meters and viewfinder display, when they have turned off (see Custom Setting c2 Standby timer), by pressing the multi-selector in any direction. By default this is **Off**, and you can only reactivate the meters with half pressure on the shutter-release button. To allow the multi-selector to do this choose **Restart standby timer** instead.

f4 Assign Fn. button

A wide range of functions (see opposite) can be assigned to the **Fn.** button, both on its own and in conjunction with the command dials. Some of these duplicate functions normally assigned to other buttons (for example, **Preview**, which is normally assigned to the **Pv** button).

There are separate lists of options for a simple press of the **Fn.** button and for using it in conjunction with a command dial, but many of the options in the two lists are incompatible. This means that if you pick a **Press** option that is incompatible with the one you picked under **Press + command** dials, your earlier choice is deactivated, and an error message will be displayed.

f5 Assign preview button

The same range of functions can be assigned to the Preview (**Pv**) button as to the **Fn.** button. The only difference is in the default settings: for **Press**, the default

setting (unsurprisingly) is **Preview**; for **Press + Command dials**, the default setting is **None**. As with f4, many of the options are incompatible.

f6 Assign AE-L/AF-L button

Again, you can assign a wide range of functions to the **AE-L/AF-L** button. The options are almost exactly the same as those for the **Fn.** and **Pv** buttons, except that **HDR (High dynamic range)** and **Multiple exposure** aren't available under **Press + Command dials**.

For **Press**, the default setting is **AE/AF lock**; for **Press + Command dials**, the default setting is **None**.

f7 Customize command dials

You can change the operation of the command dials in various ways, with four submenus available: **Reverse rotation**, **Change main/sub**, **Aperture setting**, and **Menus and playback**.

Reverse rotation reverses the effect of rotating the dials in a given direction.

Normally, when shooting in modes **A**, **S**, and **M**, the main command dial sets shutter speed and the sub-command dial sets the aperture. Choosing **Change main/sub** modifies these roles: **On** reverses the roles completely, or you can select **On (Mode A)** to use the main command dial to select the aperture in Aperture Priority (**A**) mode.

Aperture setting determines whether the aperture ring (where present) on a lens

f4 Assign Fn. button: Press

Options	Preview	Activates depth of field preview.
	FV lock	Locks flash value (compatible flashes only). Press again to cancel.
	AE/AF lock	Exposure and focus both lock when you press Fn.
	AE lock only	Exposure locks while you hold the Fn. button.
	AE lock only (Reset on release)	Exposure locks when you press the Fn. button and remains locked until you press it again, or release the shutter, or standby timers expire.
	AE lock (Hold)	Exposure locks when you press Fn. and remains locked until you press it again, or standby timers expire.
	AF lock only	Focus locks when you press the Fn. button.
	AF-ON	Pressing the Fn. button activates focus: focus can't be activated with a half press on the shutter-release button.
	Flash off	Deactivates flash while you hold down the Fn. button.
	Bracketing burst	Activates a bracketing burst at the last used settings.
	+NEF (RAW)	When Image quality is set to JPEG , pressing Fn. also records a Raw copy of the next shot.
	Matrix metering	Press the Fn. button to activate matrix metering.
	Center-weighted metering	Press Fn. to activate center-weighted metering.
	Spot metering	Press the Fn. button to activate spot metering.
	Viewfinder grid	Press the Fn. button to show/hide the framing grid in the display viewfinder.

Viewfinder virtual Press the **Fn.** button to show a virtual horizon in the viewfinder horizon.

MY MENU Press the **Fn.** button to display My Menu.

Access top item Press the **Fn.** button to go straight to Item 1 in My Menu. in My Menu

Playback The **Fn.** button duplicates the function of the **[▶]** button.

NONE (default) Pressing the **Fn.** button has no effect.

f4 Assign Fn. button: Press + Command dials

Options **Choose Image area (default)** Press the **Fn.** button and rotate either command dial to toggle between DX and 1.3x crop.

Choose non-CPU lens number Use the **Fn.** button and either command dial to select lenses specified using Non-CPU lens data.

Active D-Lighting Press the **Fn.** button and rotate either command dial to select between Active D-Lighting options.

HDR (High dynamic range) Press the **Fn.** button and rotate the main command dial to select HDR mode. Press the **Fn.** button and rotate the sub-command dial to select HDR strength.

Auto ISO sensitivity control Press the **Fn.** button and rotate either command dial to toggle **Auto ISO sensitivity control On** and **Off**.

Multiple exposure Press Fn. and rotate the main command dial to toggle **Multiple exposure mode On** and **Off**. Press the **Fn.** button and rotate the sub-command dial to select the number of exposures in your exposure sequence.

NONE (default) Rotating a command dial while pressing the **Fn.** button has no effect.

can be used to set apertures, or whether the sub-command dial is used.

Menus and playback allows you to use the main command dial to navigate playback images and menus.

On allows you to use it for all image playback navigation and for scrolling through menu items.

On (image review excluded) allows the dial to be used in playback only when you initiate playback with ; it won't apply to images displayed immediately after shooting.

f8 Release button to use dial

Normally, buttons such as , , and must be kept pressed while the appropriate command dial is rotated to make changes. If you activate this option by selecting **Yes**, you can continue to make changes after releasing the button. The same also applies to the **Fn.**, **Pv**, and **AE-L/AF-L** buttons if you've given them a **Press + Command dials** function (using Custom Settings f4, f5, and f6 respectively).

f9 Slot empty release lock

By default (when **OK** is selected), the shutter can be released even if no memory card is present. Images are held in the camera's buffer and can be displayed on the monitor in "demo mode," but they are not recorded. The obvious use for this is when the camera is on display at a shop or trade show.

Alternatively you can select **LOCK**. This means that the shutter can't be released unless there's a memory card in the camera. The obvious lack of response protects you against shooting away happily for hours, only to discover later that no images have been recorded.

f10 Reverse indicators

This governs how the exposure displays in the viewfinder and Information Display are shown. By default (**-0+**), overexposure is indicated by bars at the right side and underexposure is at the left: **+0-** reverses this so that overexposure is at the left. There's no reason to change this setting other than personal preference.

f11 Easy shutter speed shift

By default, you change shutter speeds either with the shutter speed dial on the top-plate or with the main command dial. This menu allows you to regain some of the flexibility offered by the main command dial while still using the shutter speed dial as your primary speed selector.

**THE SETUP MENU**

The Setup menu controls important camera functions, although many of these will only be accessed occasionally, if at all.

› Format memory card

This is the one item in this menu you will probably use regularly, especially as the Df does not offer any alternative method of formatting a card. The formatting process is outlined on page 30.

› Monitor brightness

This allows you to change the brightness of the LCD display using ▲ / ▼. Use with care, as making review/playback images appear brighter does not mean the exposure of the images will be any brighter. The point of this is to adapt to

changing light levels in your surroundings. The screen shows a “step-wedge” with ten bands ranging from very dark to very light gray. It should be possible to distinguish clearly between all of them.

Note:

This does not apply to Live View shooting: monitor brightness for this is adjusted separately.

› Auto info display

By default (when **Auto info display** is **Off**), the Information Display only appears when you press **INFO** or **◀▶**. This obviously helps to save power.

If you turn this item **On**, the Information Display appears automatically when you half-press the shutter-release button. This can be useful when working on a tripod. If **Image Review** is **Off**, the Information Display will also appear immediately after you take a shot.

› Clean image sensor and Lock mirror up for cleaning

For more details see page 216.

› Image Dust Off ref photo

Nikon Capture NX2 can automatically remove dust spots on images by comparing them to a reference photo that maps dust on the sensor. This can save a lot of work compared to manually removing spots from your images; this option allows you to take a suitable reference photo.

To take a reference photo

- 1) Fit a CPU lens of at least 50mm focal length. Locate a featureless white object, such as a sheet of plain paper, which is large enough to fill the frame.
- 2) Select **Image Dust Off ref photo** from the Setup menu and press ►.

- 3) Select **Start** or **Clean sensor** and then **start** and press **OK**. (Select **Start** if you have already taken the picture(s) from which you want to remove spots).

- 4) Frame the white object at a distance of about 4 inches/10cm. Press the shutter-release button down halfway. Focus will be set automatically at infinity to create a soft white background that any dust spots will stand out from.

- 5) Press the shutter-release button fully to capture the reference image.

› Flicker reduction

Some light sources can produce visible flicker in the Live View screen image. To minimize this set **Flicker reduction** to match the frequency of the local power supply: **50Hz** is normal in the European Union (including the UK), while **60Hz** is more common in North America. Usually, you can leave this on **Auto** and the camera will adjust automatically.

Note:

While flicker in the screen image may be annoying, it will not have any effect on the images you shoot.

› Language

Choose one of 28 languages for the camera to use in its menus and dialogs.

› Time zone and date

Sets date, time, and time zone, and also specifies the date display format (**Y/M/D**, **M/D/Y**, or **D/M/Y**). Set your home time zone first, and then set the time correctly. If you travel to a different time zone, simply set the time zone accordingly and the time will be updated automatically.

› Auto image rotation

If set to **On** (default), information about the orientation of the camera is recorded with every photo taken, ensuring that your images will appear the right way up when viewed with Nikon View NX2/Capture NX2 and most third-party imaging applications. (To regulate how photos appear on the camera's own screen, use the **Rotate tall** option from the Playback menu.)

› Image comment

Allows you to append brief comments of up to 36 characters to images. Comments appear in the third info page on playback and can also be viewed in Nikon View NX2 and Nikon Capture NX2. To attach a comment, select **Input comment** and press **►**. Use the multi-selector to input text as described on p103. When you are finished press **⊗**. Select **Attach comment**, then **Done**, and press **OK**. The comment will be attached to all new shots until it is turned off again.

› Copyright information

Copyright is a fundamental right and exists automatically in every photo you take. There should be no need to "copyright" images, but making a clear statement that you hold the copyright in your images can be an important protection against the theft or misappropriation of your creative work. It doesn't confer any rights that you don't have anyway, but it may make it easier to enforce those rights. One way to do this is to use this menu, which allows copyright information to be embedded into file data, using the standard method of text input.

There are separate fields for **Artist** and **Copyright**, but under UK law, and in many other countries, the artist (photographer) and copyright holder are usually one and the same person, as copyright belongs automatically to the person creating the image. The exception is photographers shooting in the course of their permanent employment, when copyright may belong to the employer instead.

To attach Copyright information to all subsequent photos select **Attach copyright information**, scroll up to **Done**, and then press **OK**.

Use this facility with caution if other people may use the camera.

Warning!

Your carefully embedded copyright information can disappear when photos are uploaded to the Internet: Save for Web in older versions of Photoshop strips such metadata by default, and many social media and image “sharing” sites also strip out an image’s metadata.

Tip

Copyright exists automatically in any photo you take, without registration. However, in the US (and a few other countries), registration may improve the chances of securing redress against infringers. It is a cumbersome bureaucratic process, though.

› Virtual horizon

This displays a horizon indicator on the LCD to assist in leveling the camera. Green bars indicate when the camera is level.

The Df’s virtual horizon display shows both left-right tilt (roll) and front-back tilt (pitch). The tilt indicator is useful in making sure that horizons are level, while the pitch indicator can help you keep the camera-back vertical. This is the best way to avoid converging verticals when shooting architecture and similar subjects.

› HDMI

You can connect the camera to HDMI (High Definition Multimedia Interface) TVs with a special cable (not supplied) and this menu sets the camera’s output to match the HDMI device. You can usually find this information in the device’s specifications or instructions.

The **Device control** submenu applies when the camera is connected to an HDMI-CEC television, and allows the TV remote (rather than the multi-selector) to be used to navigate through images.

› Save/load settings

Allows you to save many of the camera settings (see next page) to a memory card. If a card containing this settings file is inserted later, these saved settings can be restored quickly. This is useful, for instance, if more than one person shares the camera, but each photographer requires many different settings.

It can also be used to transfer settings quickly to another Nikon Df, but not to other models. The settings file is named NCSETUPD and the procedure will fail if the file name is changed.

Menu	Saved settings
Playback menu	Playback display options Image review After delete Rotate tall
Shooting menu	Shooting menu bank File naming Image quality Image size Image area JPEG compression NEF (RAW) recording White balance (including fine tuning) Set Picture Control Auto distortion control Color space Active D-Lighting Long exposure NR High ISO NR Auto-ISO sensitivity control Vignette control
Custom Setting menu	All Custom Settings in all settings banks
Setup menu	Auto info display Clean image sensor (auto settings) Flicker reduction Time zone and date display format (does not reset the time and date themselves) Language Auto image rotation Image comment Copyright information Non-CPU lens data HDMI Location data Assign remote Fn. button Wireless mobile adapter Eye-Fi upload
My Menu/Recent settings	All My Menu items All recent settings

› Non-CPU lens data

It's a particular selling point of the Nikon Df that it accepts virtually all Nikkor F-mount lenses ever made. Many of these older lenses are ruggedly built and optically excellent.

However, when a lens lacks a built-in CPU, little information is available to the camera and shooting options are drastically reduced. Using this menu to specify the focal length and maximum aperture of a given lens can restore important functions. If several non-CPU lenses are available this data can be specified for each one and each can be assigned a number, which saves having to input the details manually each time. Data can be stored for up to nine such lenses.

In a refinement unique to the Df, you can also specify the meter-coupling method of the lens (**AI lens** or **Non-AI lens**). For more about lens types and the use of older lenses in particular, see chapter 6.

› Wireless mobile adapter

This menu is only relevant if you attach a Wireless Mobile Adapter WU-1a. Use this option to **Enable** or **Disable** the adapter's connection to a smart device.

› AF fine-tune

With this menu, allowance can be made for slight variations in AF performance between different lenses (back-focus or front-focus). This applies to CPU lenses only.

The camera can store details for up to 20 lenses and it will subsequently recognize these lenses automatically. This feature should be used with care and only when you are certain that back-focus or front-focus exists: it is **OFF** by default.

Detecting back- or front-focus requires careful testing. One method is to compare results using standard AF with those from Live View. Use a solid tripod to avoid camera movement and make absolutely sure that the same focus point is being targeted by both AF systems.

› Assign remote Fn. button

Certain Nikon remote control units have their own Fn. button. This menu allows you to decide what role that button will play. The options are: **Same as camera Fn. button** (as set using Custom Setting f4); **Same as camera Pv button** (set in Custom Setting f5); **Same as camera AE-L/AF-L button** (determined by Custom Setting f6).

› Location data

This is used to set up a connection between the Df and a compatible GPS device (see page 229).

› Eye-Fi upload

This menu option will only be visible if an Eye-Fi card is inserted (see page 225). It then allows you to **Enable** (default) or **Disable** the automatic uploading of photos over a Wi-Fi network.

› Firmware version

Firmware is the onboard software that controls the camera's operation. Nikon issues updates periodically: this menu shows the version presently installed so you can verify whether it is current.

When new firmware is released, download it from the Nikon web site and copy it to a memory card. Insert this card in the camera and then use this menu option to update the camera's firmware.

Note:

Firmware updates may add new functions and new menu items to the camera, which can make this book (and Nikon's own manual) appear out of date.

» THE RETOUCH MENU



THE RETOUCH MENU



The Retouch menu is another feature for which there was simply no in-camera equivalent in the days of classic 35mm SLRs. It allows you to make corrections and enhancements to images, including cropping, color balance, and much more. These changes do not affect the original image; instead, a copy is created to which the changes are applied. Further retouching can be applied to the new copy, but you can't apply the same effect twice to the same image.

Copies are always created in JPEG format, but the size and quality depends on the format of the original, as detailed in the table opposite. Note that there are a few exceptions, such as **Trim** and **Resize**, which produce copies that are smaller than the original.

To create a retouched image

Retouching can begin either from the Retouch menu or from normal playback.

- 1)** If starting from the Retouch menu, select the desired retouch option and press ►. A screen of image thumbnails appears. Select the required image using the multi-selector, as in normal image playback. Press OK. If subsidiary options appear, make a further selection and press ► again. A preview of the retouched image appears.
- 2)** If starting from normal playback, select the required image and press ◄. Select the desired retouch option and press ►. If further options appear, make additional selections and press ► again. A preview of the retouched image appears.
- 3)** Depending on the type of retouching to be done there may be further options to choose from.
- 4)** Press OK to create a retouched copy. ◀ takes you back to the options screen and ► lets you exit without creating a copy.

› Side-by-side comparison

This option is not part of the regular Retouch menu; it is only available in full-frame playback when a retouched copy (or its source image) is selected by pressing ◄. When activated, it displays the copy alongside the original source image. Highlight either image with ◀ / ► and press □ to view it full frame. Press ► to return to normal playback or press OK to go back to the playback screen with the highlighted image selected.

› D-Lighting

Though related, D-Lighting should not be confused with Active D-Lighting. Active D-Lighting is applied before shooting, while D-Lighting is applied later. In essence, D-Lighting lightens the shadow areas of the image. The D-Lighting screen shows a side-by-side comparison of the original image and the retouched copy; press □ to zoom in on the copy. Use ▲ / ▼ to select the strength of the effect: the options are **High**, **Medium**, or **Low**.

Format of original photo

Quality and size of retouched copy (JPEG)

NEF (RAW)	Fine; Large
TIFF	Fine; Size matches original
JPEG	Quality and size match original

Trim



TRIM GUIDE

When you use Trim, the area of the new image is indicated by a yellow rectangle.

Trim allows you to crop images to improve their framing or match a specific print size. A preview screen indicates the crop area with a yellow rectangle. You can change the aspect ratio of the crop using the main command dial (see grid below) or adjust its size using and . Shift the crop area's position using the multi-selector.

Monochrome



MONOCHROME EFFECTS

Cyanotype (left) and Sepia (right).



This allows you to create monochrome copies, either in **Black-and-white**, **Sepia** (a brown-toned effect), or **Cyanotype** (a blue-toned effect). If you choose **Sepia** or **Cyanotype** you can make the toning effect stronger or weaker using / .

Aspect ratio

Possible sizes for trimmed copy (pixels)

3:2	4480 x 2984	3840 x 2560	3200 x 2128	2560 x 1704	1920 x 1280	1280 x 856	960 x 640	640 x 424
4:3	4384 x 3280	3840 x 2880	3200 x 2400	2560 x 1920	1920 x 1440	1280 x 960	960 x 720	640 x 480
5:4	4096 x 3280	3600 x 2880	3008 x 2400	2400 x 1920	1808 x 1440	1200 x 960	896 x 720	608 x 480
1:1	3280 x 3280	2880 x 2880	2400 x 2400	1920 x 1920	1440 x 1440	960 x 960	720 x 720	480 x 480
16:9	4928 x 2768	4480 x 2520	3840 x 2160	3200 x 1800	2560 x 1440	1920 x 1080	1280 x 720	960 x 536
								640 x 360

› Filter effects

Mimics several once-common filters. **Skylight** reduces the blue cast that can affect photos taken on clear days with a lot of blue sky. Applied to other images its effect is very subtle, even undetectable. **Warm filter** has a much stronger warming effect. **Red**, **Green**, and **Blue intensifier** are all fairly self-explanatory, as is **Soft**.

Cross screen, however, is an enigmatic name. “Star” would have been better, as this filter effect creates a “starburst” effect around light sources and other very bright points, such as sparkling highlights on water. There are multiple options for this filter effect, as noted below.

CROSS SCREEN

The starburst effect seemed appropriate here.



Cross screen option Description

Number of points	Create 4-, 6-, or 8-pointed star.
Filter amount	Choose brightness of light sources that are affected.
Filter angle	Choose angle of the star-points.
Length of points	Choose length of the star-points.
Confirm	See a preview of the effect; press ↗ to see it full screen.
Save	Create a copy incorporating the effect.

› Red-eye correction

This tackles the notorious problem of “red-eye,” which is caused by using on-camera flash. This option can only be selected for photos taken using flash. The camera analyzes the photo for evidence of red-eye. If red-eye is detected a preview image appears—use the zoom controls and multi-selector to view it more closely. If no red-eye is found the process ends.

› Color balance

Creates a copy with a modified color balance. When this option is selected a preview screen appears and the multi-selector can be used to move around a color grid. The effect is shown in the preview and in the histograms alongside it: use  to zoom in on the preview.

› Image overlay

Image overlay allows you to combine two existing photos into a single, new image. This can only be applied to originals in Raw format. Nikon claims that the results are better than combining the images using image-editing software because Image overlay makes direct use of the raw data from the camera’s sensor. However, this is debatable—certainly, a large, calibrated computer screen gives you a much better preview of the result.

Tip

*Although Image overlay only works with Raw images, the size and quality of the resulting JPEG image depends on the current **Image quality** and **Image size** settings. So, before creating your Image overlay, make sure these settings are as required. You can also create a new Raw image using this method—it’s the only Retouch menu option that allows you to do this.*

Using Image overlay

1) Select **Image overlay** from the Retouch menu and press . The next screen has panels labeled **Image 1**, **Image 2**, and **Preview**. Initially, **Image 1** is highlighted. Press .

2) The camera displays thumbnails of all the Raw images on the memory card. Select the first image required for the overlay and press . Press  to move to **Image 2** and select the second image.

3) Use the **Gain** control below each image to determine its “weight” in the final overlay. The preview changes to show the effect of increasing or decreasing the **Gain**.

4) Use  /  to move between **Image 1** and **Image 2** if further changes are

required. Press **OK** to change the selected image in either position.

5) Press ► to go to the **Preview** panel. Highlight **Overlay** and press ↗ to preview the composite image. To save the combined image, highlight **Save** and press **OK**.

› Quick retouch

Provides basic one-step retouching for a quick fix, boosting saturation and contrast. D-Lighting is applied automatically (if the algorithm requires it) to retain shadow detail. Use ▲ / ▼ to increase or reduce the strength of the effect, then press **OK** to create a retouched copy.

› NEF (RAW) processing

This menu creates JPEG copies from images originally shot as Raw files. It doesn't replace full Raw processing on a computer, but it does allow the creation of quick copies for immediate sharing or printing.

Options available for the processing of Raw images (see below) are displayed in a column at the right of the preview image. These allow considerable control over the output image and when you are satisfied with the previewed image, select **EXE** and press **OK** to create the JPEG copy. Press ► to exit without creating a copy.

Raw option	Description
Image quality	Set Fine , Normal , or Basic quality (see page 69).
Image size	Set size to Large , Medium , or Small (see page 72).
White balance	Choose a white balance setting. The options are similar to those described on page 73.
Exposure compensation	Adjust exposure (brightness) levels up to ±2EV.
Picture Control	Choose any of the range of Nikon Picture Controls (see page 92) to be applied to the image. Fine-tuning options can also be applied.
High ISO NR	Choose level of noise reduction (see page 108).
Color space	Choose color space (see page 77).
Vignette control	Apply Vignette control (see page 107).
D-Lighting	Choose D-Lighting level (High , Normal , Low , or Off). See page 131.

› Resize

This option creates a small copy of the selected picture(s), suitable for immediate

use with various external devices. Five possible sizes are available:

Option	Size (pixels)	Possible uses
3.5M	2304 x 1536	Display on Retina MacBooks and other high-resolution devices.
2.5M	1920 x 1280	Display on HDTV, larger computer monitor, and new iPad.
1.1M	1280 x 856	Display on typical computer monitor and older iPad.
0.6M	960 x 640	Display on standard TV and iPhone 4/5.
0.3M	640 x 424	Display on majority of mobile devices.

Resize can be accessed from the Retouch menu or from image playback, but there are slight differences in the procedure. From the Retouch menu you select a picture size first and then select the picture(s) to be copied at that size. From playback you select the picture first and then the copy size; this way you can only copy one picture at a time.

Tip

Resize creates copies using the full image area of the original image, and therefore with the same aspect ratio. To create cropped copies, or copies with a different aspect ratio, use Trim.

› Straighten

It's best to get horizons level at the time of shooting, but it doesn't always happen. This option allows correction by up to 5° in steps of 0.25°. Use ► to rotate clockwise, ◀ to rotate counterclockwise. Inevitably, this crops the image slightly. Press OK to create the retouched copy or ▶ to exit.

Note:

The Nikon manual that comes with the Df states "edges of the image will be trimmed to create a square copy" when you use Straighten, but clearly this is an error: it should read "rectangular," not "square."

› Distortion control

Some lenses create noticeable curvature of straight lines: this menu allows you to correct this in-camera, although it does crop the image slightly.

Auto allows automatic compensation for G-type and D-type Nikkor lenses, but it can't be used on images taken with other lenses. This option will not be available for JPEG or TIFF photos taken with Auto distortion control (see page 107) in effect. After correction, the multi-selector can be used to fine tune the result.

Manual can be applied whatever lens was used; use ► to reduce barrel distortion and ◀ to reduce pincushion distortion.

› Color outline

Detects edges in the photograph and uses them to create a “line-drawing” effect. There are no options to alter the effect.

› Color sketch

Creates a copy resembling a colored pencil drawing. Controls for **Vividness** and **Outlines** adjust the strength of the effect.

COLOR SKETCH

Vividness and Outlines both set to maximum.



› Selective color

You can select up to three specific color(s) to be preserved in the retouched copy, while any other hues are reduced to shades of gray.

- 1) Use the multi-selector to place the cursor over an area of the color you want to preserve. Press **AE-L/AF-L** to set that color.
- 2) Turn the main command dial and then use **▲ / ▼** to alter the color range, so the camera is more or less selective with the color.

3) To select another color, turn the main command dial to highlight another “swatch” and repeat steps 1 and 2.

4) To save the retouched copy, press **OK**.

› Fisheye

Instead of correcting it, this Retouch menu option exaggerates barrel distortion to give a fisheye lens effect. Use **▶** to strengthen the effect and **◀** to reduce it.

SELECTIVE COLOR



› Perspective control

Corrects the convergence of vertical lines in photos taken looking up, for example, at tall buildings. Grid lines aid in assessing the effect, and the strength of the correction is controlled using the multi-selector. The process inevitably crops the original image, so if you're shooting an image where you plan to use perspective control later, make sure to leave room around the subject. For alternative approaches to perspective control see p198.

› Miniature effect

This option mimics the fad—already done to death—for shooting images with an extremely small and localized depth of field, making real landscapes or city views look like miniature models.

It usually works best with photos taken from a high viewpoint, as these generally have clearer separation of foreground and background. A yellow rectangle shows the area that will remain in sharp focus: you can reposition it using ▲ / ▼. Use ◀ / ▶ to make the “in-focus” zone appear wider or narrower and press □ to flip it through 90 degrees.

Press to preview the results and press to save a retouched copy.

» MY MENU AND RECENT SETTINGS



THE RECENT SETTINGS MENU



My Menu is a convenient way to speed up access to menu items that you use most frequently. Items from any other menu can be added to My Menu to create a handy shortlist, up to a maximum of 20 items.

Alternatively, you can activate the Recent Settings menu, which stores the 20 most recent settings you have chosen from the other menus.

Tip

To delete the item highlighted in My Menu, press . A confirmation dialog appears. To confirm deletion press again.

To add items to My Menu

1) In My Menu, highlight **Add items** and press ►.

2) A list of the other menus now appears. Select the appropriate menu and press ►.

3) Select the desired menu item and press **OK**.

4) The My Menu screen reappears with the newly added item at the top. Use ▼ to move it lower down the list if desired. Press **OK** to confirm the new ordering of the list.

To remove items from My Menu

1) In My Menu, highlight **Remove items** and press ►.

2) Highlight any item in the list and press **OK** or ► to select it for deletion. A check mark appears beside the item.

3) If more than one item is to be deleted, use ▲ / ▼ to select additional items.

4) Highlight **Done** and press **OK**. A confirmation dialog appears. To confirm the deletion(s) press **OK** again. To exit without deleting anything, press **MENU**.

To rearrange items in My Menu

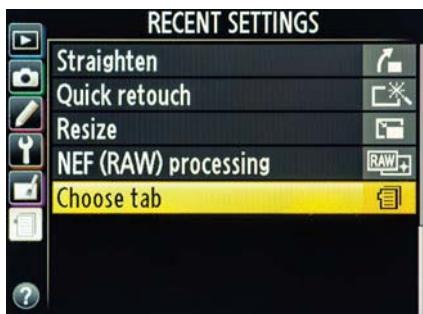
1) In My Menu, highlight **Rank items** and press ►.

2) Highlight any item and press **OK**.

3) Use ▲ / ▼ to move the item up or down: a yellow line shows where its new position will be. Press **OK** to confirm the new position.

4) Repeat steps 2 and 3 to move further items. When finished, press **MENU** to exit.

Recent Settings



CHOOSE TAB

Choose tab allows you to switch between My Menu and Recent Settings.

The Recent Settings menu stores up to 20 items. You must activate Recent Settings before any items can be recorded.

To activate Recent Settings

1) In My Menu, select Choose tab and press .

2) Select Recent Settings and press .

The menu title changes to Recent Settings. Now, any changes to settings made using the other menus will be recorded and will be visible when you revisit Recent Settings. Select any item from the list and press  to access its options. To revert to My Menu use the **Choose tab** procedure again.

Tip

*Recent Settings only stores items from the menus. It does not record changes made using buttons and dials. For instance, if you change **Image quality** using the Shooting menu, this will be recorded, but if you use  and the main command dial, this will not appear in Recent Settings.*

To remove items from the Recent Settings menu

It is possible to delete items from the list, which may be useful if you've recently made extensive use of the Retouch menu, for example. By deleting the Retouch options from the Recent settings list you bring shooting settings—which are usually the ones to which quick access is most helpful—back to the top of the list.

1) Highlight any item in the list and press  to select it for deletion. A confirmation dialog appears.

2) To go ahead with the deletion(s) press  again. To exit without deleting anything, press .

Note:

If you start with a "full" Recent Settings menu of 20 items, deleting items simply makes the list shorter—the camera does not "recall" older items.

3 » SIMPLICITY

This shot may look simple, and that is very much the point. But simple is not the same as easy, and this took longer to get right than most shots. This was largely because there was no room for imprecision—it had to be “just right.” This involved a delicate interplay of height above the subject, focal length, and the exact alignment of the camera.

Settings

- › Focal length: 85mm
- › Aperture: f/10
- › Shutter speed: 1/100 sec.
- › ISO: 720



» COMPOSITION IN ACTION

This may not look like a classic action shot, but the timing was crucial. I'd been waiting for a few minutes for a group like this to come along, and when I saw this sextet so evenly spaced on the path I knew it wasn't going to get better than this. "Rule of Thirds" fundamentalists may say that this is a "thirds" composition, but that was not in my thoughts at the time. The placing of the top edge was set by the limits of the sunlit area, and the bottom edge needed to leave space for the walkers' shadows. Everything else followed from that.

Settings

- › Focal length: 200mm
- › Aperture: f/8
- › Shutter speed: 1/200 sec.
- › ISO: 200



The Nikon Df does not have a built-in flash, which is certainly in keeping with its classic 35mm forebears, as well as being in line with the company's flagship D4s. However, in other ways it seems less highly featured than other Nikon DSLRs, such as the D800, D610, and D7100.



It's true that a small, popup flash is not much use on its own as a main light (its range is limited and the quality of the light is ugly), but it still has the ability to play a role as a source of fill-in light.

Furthermore, on cameras such as the D800, D610, and D7100, the built-in flash can act as a commander for a multi-flash wireless setup, which makes it a powerful professional tool.

Nikon clearly assumes that Df owners either won't use flash or will be prepared to swallow the expense—not to mention the extra bulk and weight—of a separate flash. They undoubtedly hope that those who fall into the second category will be drawn to the company's own range of flashes (Speedlights), which are of high quality, but relatively expensive.

In reality, there are few serious photographers for whom never using flash is a realistic option. Even in landscape photography it often has a role to play for foreground fill. Yet there are many for whom the use of flash remains something

Df WITH FLASH

«

of a dark art. It mystifies many people why professionals seem to use flash on bright days, for example—exactly the opposite of what might be expected. This could be particularly evident with the Df given its exceptional ability in coping with low light.

Despite its low-light prowess, the Df is still capable at managing flash exposure automatically when used with a suitable flash. However, to get the best out of flash—and to make informed decisions about when to use it and when to do without, you need to understand a few basic principles.

› Flash principles

All flashes are small. All flashes are weak.

These two statements are key to understanding flash photography, especially with built-in flashes, and even more so for compact cameras where the flash is typically even smaller and weaker.

Because it's small, a flash produces very hard light. It's similar to direct sunlight, but even the strongest sunlight is softened slightly through scattering and reflection. The good news is that we can use the same principles to soften flash.

The weakness of flash is even more fundamental. Above all, it means that all flashes have a limited range, and while accessory flashes are generally more

powerful than built-in units (which extends their range), they are still limited.

Built-in flashes raise a third issue, too: their fixed position, close to the lens, makes the light one-dimensional and the same for every shot, which is boring! Accessory flashes give us a range of additional options, especially when we take them away from the camera.

Finally, there's an important distinction between using a flash as the main (or only) light source and using it as a supplementary light. The most common supplementary use is as a fill light, but flash can also be used as an accent, to add extra definition, or to give a sharper image of a fast-moving subject. We will cover all of this—and more—in this chapter.

» THE NIKON CREATIVE LIGHTING SYSTEM

Nikon's Creative Lighting System (CLS) was first seen in 2003. It embodies a number of innovations to make the use of flash not just easier, but equally importantly, more flexible. These include i-TTL flash metering, FV (flash value) lock, advanced wireless control, and auto FP high speed sync, all of which we'll examine in this chapter.

CLS requires both a compatible camera body (such as the Df) and one or more compatible flashes. These include all

current Nikon Speedlight models, as well as several models that are now officially discontinued (but may still be available).

Many older Nikon flashes can also be used with the Df, but advanced CLS functions such as wireless flash control will not be available. The Df manual gives a list of such units. The following shows CLS-compatible Speedlights made by Nikon, both current and discontinued.

CLS-compatible Speedlights

Speedlight model	Guide number (meters @ ISO 100)	Use as commander?	Current or discontinued?
SB-800	38	Yes	Discontinued
SB-600	30	No	Discontinued
SB-400	21	No	Discontinued
SB-R200	10	No	Current
SB-900	34	Yes	Discontinued
SB-700	28	Yes	Current
SB-910	34	Yes	Current
SB-300	18	No	Current

› Using third-party flashes

Nikon issues dire warnings about using other brands of flash with its cameras, and certainly doesn't want to let on that third-party units may be compatible with CLS control. However, manufacturers such as Sigma produce units that are fully compatible with i-TTL flash metering and, to a limited extent, with wireless flash control as well.

On the other hand, some flashes may use too high a trigger voltage or even the wrong polarity, which could damage the camera's circuitry. It's therefore best to avoid mounting or connecting any non-Nikon flash unless it's from a reputable maker and its information clearly states that it is compatible with the Df.

Warning!

The risk of encountering excessive voltages is even more pronounced with studio flash units. When using Nikon DSLRs with studio flash—shooting images of the camera for this book, for example—I've never connected them directly. Instead, I use a Speedlight (or built-in unit on cameras that have one) to trigger the studio flash in "slave" mode.



SIGMA EF-610 DG SUPER FLASH



» FILL-IN FLASH

A key application for flash is as a “fill-in” light, giving a lift to dark shadows such as those cast by direct sunlight. This is one of the main reasons why pros and other expert photographers regularly use flash in bright sunlight (exactly when most people would think it unnecessary). In fact, fill-in flash is so important that the default

settings for the Df and for CLS-compatible units assume you’ll be using flash for this purpose, rather than as the main light.

Fill-in flash doesn’t need to illuminate the shadows fully, only lighten them a little. This means the flash can be used at a smaller aperture or greater distance than when it’s the main light.



› i-TTL balanced fill-flash

Nikon’s i-TTL balanced fill-flash helps achieve natural-looking results when using fill-in flash. It comes into play automatically provided matrix or center-weighted metering is selected.

The flash emits a series of virtually invisible pre-flashes immediately before exposure. Light reflected from the subject is detected by the metering sensor and analyzed together with the ambient light. If a D-type or G-type lens is used, distance information is also incorporated.

The flash metering is likely to be less accurate if a non-CPU lens is used, but

FILL-IN FLASH

The background exposure is the same for both shots, but using flash (bottom) lightens the shadowy side of the bush while scarcely affecting the sunlit areas.

results can be improved if the focal length and maximum aperture of the lens are specified using the **Non-CPU lens data** function in the Setup menu.

FILL FLASH

i-TTL balanced fill-flash gives a natural-looking result: it's not overly obvious that flash has been used, but without it the rider would be much more shadowy. I was using an SB-700 Speedlight with Auto FP High Speed sync, which allowed me to set shutter speeds beyond the Df's normal 1/200 sec. limit.

› Standard i-TTL flash

If spot metering is selected, Standard i-TTL flash is activated instead (it can also be selected directly on some accessory flashes). In this mode the camera controls the flash output to light the subject correctly, but makes no attempt to balance the flash with the background illumination. This mode is more appropriate when flash is used as the main light source, rather than as a fill light.



» FLASH EXPOSURE

Whether the shutter speed is 1/200 sec. or 20 seconds, the flash normally fires just once and therefore delivers the same amount of light to the subject. In the absence of any other light, the subject would look the same whatever shutter speed was used.

Shutter speed becomes relevant when there is other light around, which we call ambient light: slower shutter speeds give ambient light more chance to register.

Aperture, however, is relevant to both the flash exposure and the ambient exposure. The camera's flash metering takes this into account, but it is useful to understand this distinction for a clearer sense of what's going on, especially with slow-sync shots. The combinations of shutter speed and aperture that are available when using flash depend on the exposure mode in use, as outlined below.

Exposure mode	Shutter speed	Aperture
P	Set by camera. The normal range is between 1/200 sec. and 1/60 sec., but in certain flash modes all settings up to 30 seconds are available.	Set by camera
S	Selected by user. All settings between 1/200 sec. and 30 seconds are available. If user sets a faster shutter speed, the Df will fire at 1/200 sec. while the flash is active.	Set by camera
A	Set by camera. The normal range is between 1/200 sec. and 1/60 sec., but in certain flash modes all settings up to 30 seconds are available.	Set by user
M	Selected by user. All settings between 1/200 sec. and 30 seconds, plus B and T, are available. If user sets a faster shutter speed, the Df will fire at 1/200 sec. while the flash is active.	Set by user

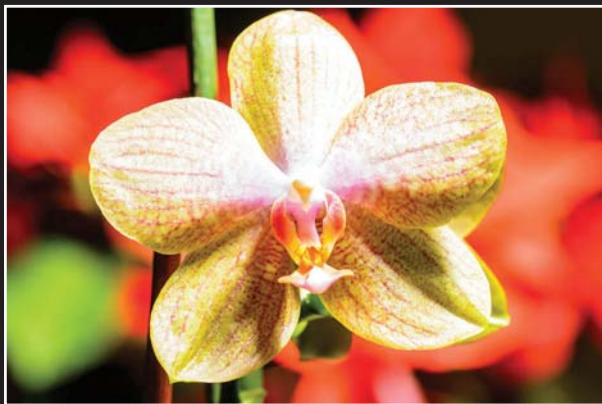
» SHUTTER SPEED

Here, continuous lighting lights the background and the orchid bloom at the front is illuminated by flash. Increasing the exposure time (bottom image) makes the background brighter, but has no effect on the flash image.



Settings

- › Focal length: 100mm
- › Shutter speed: 1/2 sec. and 2 sec.
- › Aperture: f/11
- › ISO: 100



› Flash range

The range of any flash depends on its power, the ISO sensitivity setting used, and the aperture in use. The grid below details the approximate maximum range of a Nikon SB-700 for selected distances, apertures, and ISO settings, assuming a 50mm lens. The grid is based on Nikon's own figures, confirmed by practical tests.

There's no need to memorize these figures, but it does help to have a general

sense of the limited range that always applies when using flash. A quick test shot will tell you if your subject is within range.

Officially, even at higher ISO settings than in the grid, the maximum range of the SB-700 is 20 meters (65ft). It may be able to illuminate more distant subjects, but it's increasingly unlikely that i-TTL flash metering will be as accurate as usual. Other Speedlights have similar limits.

ISO equivalent setting						Flash range	
100	200	400	800	1600	3200	Meters	Feet
f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	19.8	65
f/2	f/2.8	f/4	f/5.6	f/8	f/11	14.2	47
f/2.8	f/4	f/5.6	f/8	f/11	f/16	9.8	32
f/4	f/5.6	f/8	f/11	f/16	f/22	7	23
f/5.6	f/8	f/11	f/16	f/22	f/32	4.9	16
f/8	f/11	f/16	f/22	f/32		3.5	11.5
f/11	f/16	f/22	f/32			2.6	8
f/16	f/22	f/32				1.6	5

» ADDING INTEREST

The limited range of the flash is apparent in this nocturnal landscape, but it adds some much needed foreground interest. In this instance the flash was used off-camera so the lighting wasn't obviously from the camera position.

Settings

- › Focal length: 14mm
- › Aperture: f/11
- › Shutter speed: 128 sec.
- › ISO: 1600



› Guide number

The guide number (GN) is a measure of the power of a flash. In the past, the guide number was used to calculate flash exposures and working range, but with the Nikon CLS, such computations are rarely needed. The GN does help us compare different flash units, though. For instance, the GN for the built-in flash on most Nikon DSLRs is 12 meters @ ISO 100, but for the Nikon SB-700 it is 28m @ ISO 100. This indicates the SB-700 has over twice the power, which would allow it to be used at more than double the distance, at a lower ISO, or with a smaller aperture.

The flash-head on the SB-700 (and several other Speedlights) also has a zoom function, which means it can deliver a tighter beam to match the coverage of longer lenses. This changes the effective guide number, which is why the ranges given previously are based on a 50mm focal length.

Tip

The GN of a flash is specified in feet and/or meters and usually at an ISO rating of 100. When comparing different flashes, be sure that both GNs are stated in the same terms.

› Flash synchronization and flash modes

Flash, as the name implies, is virtually instantaneous: a burst of flash lasts just a few milliseconds. If the flash is to cover the whole image frame it must be fired when the shutter is fully open. However, at faster shutter speeds DSLRs such as the Df do not expose the whole frame at once. In the case of the Df, the fastest shutter speed that can normally be used with flash is 1/200 sec. This is known as the sync (for synchronization) speed and is the fastest shutter speed at which the sensor is exposed in its entirety.

However, there is no 1/200 sec. position on the Df's shutter speed dial: the closest is 1/250 sec., which is too fast for correct synchronization (unless you use Auto FP with a Speedlight that supports it: see page 160). If you're using **A** or **P** modes, this isn't a problem, as the camera will set the shutter speed automatically, while in **S** or **M** modes, turning the shutter speed dial to the **X** position sets the shutter-speed to 1/200 sec. Of course, if you're using the main command dial to set shutter speeds you can easily set 1/200 sec. yourself.

Flash modes are distinguished by how they regulate synchronization and shutter speed. To choose a flash mode, press  and rotate the main command dial. The setting is shown in the Information Display.

Standard flash mode (front curtain sync)

This is the default mode when using **P**, **A**, **S**, and **M** exposure modes. The flash fires as soon as the shutter is fully open, so as soon as possible after the shutter-release button is pressed. In **P** and **A** modes the camera will set a shutter speed between 1/60 sec. and 1/200 sec.

Red-eye reduction

On-camera flash often creates “red-eye,” which is caused by light reflecting off the subject’s retinas. Red-eye reduction flash mode is only available with CLS-compatible flashes and works by shining a light (the AF-assist illuminator on most Nikon Speedlights) at the subject just before the exposure, causing their pupils to contract. A pre-flash or flashes may also be used.

In both cases, this creates a delay that kills spontaneity and can cause you to miss the shot entirely. Consequently, it’s better to remove red-eye during post-processing or with **Red-eye correction** from the Retouch menu (see page 134). Alternatively, take the flash off the camera or increase the ISO rating to avoid flash altogether.

Slow sync

This mode allows longer shutter speeds (up to 30 seconds) to be used in **P** and **A** exposure modes, so that the background

can be recorded, even in low ambient light. Movement of the subject and/or camera can create partial blur, combined with a sharp image where the subject is lit by the flash.

You can’t select Slow sync in **S** and **M** exposure modes, but you don’t need to: longer shutter speeds are available anyway.

Rear curtain sync

Rear curtain sync triggers the flash not at the first available moment (as with front curtain sync), but at the last possible instant. With moving subjects this means that any image created by the ambient light appears behind the subject. This effect usually appears more natural than when it extends ahead of the direction of movement.

In **P** and **A** modes it also allows you to select slow shutter speeds (below 1/60 sec.), becoming **Slow rear curtain sync**.

Shooting with rear curtain sync when you are using longer exposure times can be tricky, as you need to predict where your subject will be at the end of the exposure, rather than the instant after you press the shutter-release button. It is often best suited to working with cooperative subjects, or naturally repeating action (such as races over numerous laps of a circuit), so you can review images on the LCD screen to get your timing right.

Red-eye reduction with slow sync

This combines the two modes named, allowing backgrounds to register. This may give portraits a more natural look than regular Red-eye reduction mode, but it still creates the same exposure delay and loss of spontaneity.

Red-eye reduction with slow sync is only available in **P** and **A** exposure modes, and only with CLS-compatible flashes.

SLOW SYNC

Slow sync combines a flash image with a motion-blurred image from the ambient light. Front-curtain sync (below) makes the trails from the lights run ahead of the flash image; rear-curtain sync (bottom) lets them trail behind it.



Flash compensation

Although Nikon's Creative Lighting System offers excellent flash metering, it's not infallible. You may also want to adjust flash output for creative effect. Image review/playback lets you assess the effect of the flash, allowing compensation to be applied with confidence to further shots.

To use flash compensation, hold down and rotate the sub-command dial; the settings can be seen in both the Information Display and the viewfinder.

Flash compensation can be set up to ± 3 stops in $1/3$ -stop increments. Negative compensation reduces the brightness of flash-lit areas, while leaving ambient-lit areas unaffected; positive compensation will brighten areas lit by the flash, again leaving other areas unaffected.

However, if the subject is already at the limit of flash range, positive compensation can't make it any brighter. In this case, if you want to brighten the flash image you will need to use a wider aperture, set a higher ISO, or move closer to the subject.

After use, be sure to reset the flash compensation to zero. If you do not, then the camera will retain the setting next time you use flash.

› Manual flash

If Custom Setting e3 **Optional flash** is set to **Manual** you can control the flash output even more precisely, from full power to as low as 1/128. Some Speedlights require you to set manual power through the unit's own controls instead, in which case the menu setting will be grayed-out and unavailable.

FLASH COMPENSATION

The background exposure remains the same for these two shots, which were taken with flash compensation set at -1EV (left) and +1EV (right) respectively.

› FV lock

FV lock is like exposure lock, allowing you to lock flash output and reframe the image. This is useful when you want to use flash with an off-center subject.

Using FV lock with the Df is somewhat involved, as it requires assigning the **Fn** button to the FV lock function. Unless you're sure this is the best use of the **Fn** button, it will usually be far more convenient to apply flash compensation, using the LCD screen and test shots to determine the amount needed.



1) To assign the **Fn.** button, go to Custom Setting f4 **Assign Fn. button**. Select **FV lock** and press **OK**. You can also assign this function to the **Pv** button (Custom Setting f5) or to the **AE-L/AF-L** button (Custom Setting f6).

2) Attach a CLS-compatible flash and switch it on.

3) Position the subject centrally in the frame; half press the shutter-release button to activate focus and metering.

4) Press the **Fn.** button (or **Pv/AE-L/AF-L** if you assigned one of these instead). A pre-flash is fired to set the flash level and FV lock icons appear in both the viewfinder and Information Display.

5) Reframe the image and shoot normally. The flash level will remain locked for subsequent shots.

6) To release FV lock, press the **Fn.** (or **Pv/AE-L/AF-L**) button again.

Note:

Flash compensation and FV lock work similarly when a compatible Speedlight is attached.

› Flash exposure bracketing

Flash exposure bracketing is yet another way of delivering the required level of flash illumination. It works in the same way as exposure bracketing (see page 54), and indeed you can bracket both the flash exposure and the main exposure simultaneously: set Custom Setting e5 **Auto bracketing set to Flash only** (to vary flash level only) or **AE & flash** (to vary the main exposure as well).

1) Press **BKT** and rotate the main command dial to select the number of shots (**2**, **3**, or **5**) for the bracketing burst. Settings appear in the Information Display.

2) Still pressing **BKT**, rotate the sub-command dial to select the flash output variation between shots. Possible values run from **0.3EV** to **3.0EV**.

3) Frame, focus, and shoot normally. The camera will vary the flash output with each frame until the sequence is completed.

4) To cancel bracketing, press **BKT** and rotate the main command dial until **OF** appears in the Information Display.

» USING OPTIONAL SPEEDLIGHTS

Nikon Speedlights integrate fully with Nikon's Creative Lighting System for outstanding results. There are currently four Speedlight models available, which are all highly sophisticated units aimed primarily at professional and advanced users, and priced accordingly.

Independent makers such as Sigma offer alternatives, many of which are also compatible with Nikon's i-TTL flash control, although these dedicated units are also relatively expensive.

However, even a cheap, basic flash offers many possibilities. You may lose i-TTL metering, but great results are possible with a little trial and error. If you use certain set-ups regularly (as you may well do for portraits and close-up shots) then you can easily record and replicate the flash settings. Take note of the warning on page 147, though: you should be wary of flashes that are not certified compatible unless you can verify their trigger voltage.

There are still useful ways to employ such units, but they should not be mounted in the Df's hotshoe. For instance, any flash that has a "test" button (allowing it to be fired manually) can be used for the "painting with light" technique outlined on page 163. You may have an old flash at the back of a cupboard somewhere, and it's also worth looking in the bargain bin at your local camera store.

There is only space in this book to cover Nikon's own (current) flash units, but information about older units is included in the Df manual. Information about Sigma's flashes is available at www.sigmaphoto.com or www.sigma-imaging-uk.com/flash.

MOUNTING AN EXTERNAL SPEEDLIGHT ▾



Mounting an external Speedlight

1) Check that the Speedlight is switched off. Slide the base of the Speedlight into the camera's hotshoe. If you feel resistance check that the mounting lock on the Speedlight is released.

2) Rotate the lock lever at the base of the Speedlight to secure it in position.

3) Switch the Speedlight on. Once it is charged and ready for use a  icon appears in the viewfinder.

» BOUNCE FLASH AND OFF-CAMERA FLASH

The built-in flash on most cameras can work well as a fill-in light, but it is severely limited as a main light. Its fixed position close above the lens throws hard shadows on close subjects and gives portraits a “police mugshot” look. It’s also very prone to red-eye.

Obviously, using built-in flash isn’t an option with the Df, but simply mounting a separate Speedlight in the hotshoe will only improve things marginally: the light is still harsh and still quite close to the lens axis, so red-eye remains a common issue. However, by bouncing the light from a flash off a ceiling wall, or reflector, or by taking the Speedlight off the camera you can alter the quality of light dramatically.

› Bounce flash

Bouncing the light from your flash off a suitable surface both spreads the light (softening hard-edged shadows) and changes its direction (eliminating the flatness of direct on-camera flash).

Nikon’s SB-910 and SB-700 Speedlights have heads that can be tilted and swivelled through a wide range of angles, allowing light to be bounced off walls, ceilings, and other surfaces. The SB-400 has a basic tilt capability, allowing light to be bounced off the ceiling or a reflector.

Tips

Most surfaces will absorb some light, and the light also has to travel further to reach the subject. The camera’s i-TTL metering will adjust automatically for this, but the working range will be reduced.

Bounce flash works best in domestic interiors with fairly low ceilings (especially if they are white or light in color) rather than in larger spaces. Alternatively, you can use a reflector.

Colored surfaces will change the color of the bounced light. This may be used for creative effect, but for neutral results choose a white or silvered surface. Portrait photographers often use gold reflectors for a warmer result.

› High speed flash sync

Nikon’s SB-910, SB-700, and SB-R200 Speedlights all offer Auto FP High Speed sync. This enables the flash output to be phased or pulsed, allowing flash to be used at all shutter speeds. Combining flash with fast shutter speeds is useful when ambient

light levels are high, or you wish to use a wide aperture, or you are using fill-in flash with fast-moving subjects.

Enable Auto FP High Speed sync using Custom Setting e1: set either **1/250s (Auto FP)** or **1/200s (Auto FP)**. If a suitable Speedlight is attached, flash can then be used at any shutter speed, right up to 1/4000 sec. You should, however, be aware that the effective power (and therefore working range) of the Speedlight will reduce as the shutter speed increases. See the manual of the individual Speedlight for more details, and take test shots and review them on screen if at all possible.

» Off-camera flash

Taking the flash off the camera gives complete control over the direction of its light. The flash can be triggered wirelessly or fired using a remote cord. Nikon's dedicated flash cords will preserve i-TTL flash control.

FLASH DIRECTION

The same subject photographed using the flash in the hotshoe and aimed directly at the subject (left); off-camera flash (center); bounced flash (right). The bounce flash image has a warmer hue because the ceiling wasn't white.



› Wireless flash

Many external flash units can be fired wirelessly using a “slave” attachment, but this gives no control over flash output. However, using Nikon Speedlights such as the SB-910 and SB-700 allows you to retain full flash control, integrated with the camera’s powerful metering system. As the Df has no built-in flash you will require a separate “commander” unit, which can be another SB-910 or SB-700 flash, or a dedicated SU-800 commander. Either of these will allow you to control multiple Speedlights in up to three groups.

As an alternative to Nikon’s own units, many professionals prefer to use a radio

control system, which will generally have a greater range and also allow you to use third-party flashes. The best-known name in this field is Pocket Wizard, although I’ve had excellent results using the less expensive Phottix Odin setup.

Using multiple flashes in a wireless system gives you almost complete control over the strength and direction of the light on your subject, but it takes time to get a feel for all of the possible permutations. It’s definitely a very good idea to have a few practice-runs before using such a set-up on an important shoot.



WIRELESS FLASH

A Nikon Speedlight SB-700 was placed on a tripod at the right of the rider. I used a Phottix Odin radio trigger system to control the flash, but similar results would be possible using Nikon’s SU-800 commander unit or a sync lead. The flash is nicely balanced with the ambient light—the shadow cast by the sun is still much stronger than the one cast by the flash, but the use of flash makes the rider both brighter and sharper.

› Painting with light

You can try this with any flash that can be triggered manually. By firing multiple flashes at the subject from different directions you build up an overall coverage of light without losing the sparkle that directional light gives. It requires trial and error, but that's part of the fun. The basic steps are:

- 1)** Set up so that neither the camera nor the subject can move during the exposure.
- 2)** Use Manual mode. Set a long shutter speed, such as 20 or 30 seconds (or even T), and use a small aperture such as f/16. Focus on the subject, and then switch the focus selector to manual so the camera does not try to refocus.

PAINTING WITH LIGHT ➤

Painting with light can work outdoors. Here I set the shutter to T, pressed the shutter-release button, then moved around the scene firing several bursts of flash. I returned to the camera and pressed the shutter-release button again to end the exposure. As you can see, I inadvertently wandered into shot for one of the flashes, creating the obvious star at left.

3) Turn out the lights: it helps to have just enough background light to see what you are doing, but no more.

4) Trigger the shutter and then fire the flash at the subject from different directions (without aiming it directly into the lens).

5) Review the result and start again! If your results are too bright, use fewer flashes, a lower ISO, a smaller aperture, hold the flash further away, or a combination of these. If the flash has a variable power setting this could be turned down as well.



› Speedlight SB-910

The SB-910 is the flagship of Nikon's Speedlight range. An obvious change over earlier models is a more intuitive control interface, in line with the SB-700. It offers multiple illumination patterns, an impressive 17–200mm zoom range (extendable to 14mm with the built-in diffuser), and automatic sensor format



SPEEDLIGHT SB-910

detection (in other words, it knows whether it's attached to an FX format or DX format camera). The firmware is upgradable when the flash is attached to a camera such as the Df.

The guide number is quoted as 34m (111ft) at ISO 100, but this varies according to the zoom setting. The SB-910 can also be employed as a "commander" unit for fully automatic flash control of multiple off-camera Speedlights.

Guide number (GN): 111ft/34m

(ISO 100 and 35mm zoom setting)

Focal length coverage: 17–200mm
(extendable to 14mm with built-in adapter or separate diffusion dome)

Tilt/swivel: Yes

Batteries: 4 x AA/LR6

Approximate recycling time:

2.3 seconds (NiMh); 4 seconds (Alkaline)

Dimensions (w x h x d):

3.1 x 5.7 x 4.4in./78.5 x 145 x 113mm

Weight: 14.8oz./420g (without batteries)

Included accessories: Diffusion dome (SW-13H); Speedlight stand (AS-21); Fluorescent filter (SZ-2FL); Incandescent filter (SZ-2TN); Soft case (SS-910)



› Speedlight SB-700

The SB-700 is a highly featured flash unit with several innovative aspects including intuitive operation and a choice of illumination patterns. Although it lacks a few of the high-end features of the SB-910 (and is slightly less powerful), it still has everything most users will ever need. It is also smaller, lighter, and significantly cheaper than the SB-910.



SPEEDLIGHT SB-700



Guide number (GN): 92ft/28m

(ISO 100 and 35mm zoom setting)

Focal length coverage: 24–120mm

Tilt/swivel: Yes

Batteries: 4 x AA/LR6

Approximate recycling time: 2.5 seconds

Dimensions (w x h x d):

2.8 x 5.0 x 4.1in./71 x 126 x 104.5mm

Weight: 12.7oz./360g (without batteries)

Included accessories: Diffusion dome (SW-14H); Speedlight stand (AS-22); Fluorescent filter (SZ-3FL); Incandescent filter (SZ-3TN); Soft case (SS-700)

› Speedlight SB-300

A compact, light, and simple flash.

Guide number (GN): 59ft/18m
(ISO 100 and 35mm zoom setting)

Focal length coverage: 27mm

Tilt/swivel: Tilt only

Batteries: 2 x AAA

Approximate recycling time:
3.5 seconds (NiMh); 4 seconds (Alkaline)

Dimensions (w x h x d):

2.3 x 2.6 x 2.5in./57.4 x 65.4 x 62.3mm

Weight: 3.4oz./97g (without batteries)

Included accessories: Soft case (SS-DC1)



SPEEDLIGHT SB-300

› Speedlight SB-R200

The SB-R200 is designed principally to work as part of a close-up lighting system and can't be attached to the camera's hotshoe. Instead, it is triggered using either an SU-800 commander, or an SB-910 or SB-700 Speedlight.

Wireless Speedlight Commander SU-800

The SU-800 Speedlight Controller allows complete control over a complex setup of up to three groups of Speedlights.

Speedlight Commander Kit R1C1 and Speedlight Remote Kit R1

Dedicated kits for close-up photography: see p174 for more details.



SPEEDLIGHT SB-R200

» FLASH ACCESSORIES

Flash accessories such as diffusers, reflectors, and remote leads provide yet more flexibility and control over lighting effects, while external power packs increase flash capacity.

Speedlight stand

Allows a Speedlight to stand on a flat surface or mount on a tripod.

Flash brackets

Nikon's Speedlights can be mounted on a tripod or stand on any flat surface using a Speedlight stand, but for more portable support many photographers prefer to utilize a flexible arm or bracket attached to the camera.

Flash diffusers

Flash diffusers are a simple and economical way to spread and soften the hard light from a flash. Both the SB-910 and SB-700

DIFFUSER

» An SB-700 with a Honl diffuser attached was fired from almost directly above the flute. The light is clearly directional, but it is far softer than using a "naked" Speedlight.

come with a small dome-type diffuser, while larger third-party units, such as those from Honl, provide a "softbox" effect.

Diffusers reduce the light reaching the subject: the Df's i-TTL flash metering will compensate, but the effective range of the flash will be reduced.



NIKON DF WITH SB-700
AND HONL DIFFUSER



4

» FLASH ON LOCATION

In a busy street event there wasn't much alternative to direct, on-camera flash, but I did use a diffuser on my SB-700 to soften the light slightly. One of the major drawbacks of direct flash—ugly shadows on the background—is avoided here because the background is out of range. I kept the shutter speed fairly high to avoid camera-shake in the ambient light part of the image.

**Settings**

- Focal length: 100mm
- Aperture: f/4
- Shutter speed: 1/100 sec.
- ISO: 3200

» CREATIVE LIGHTING

How do you get light to the interior of a shell without damaging it? There may be several ways, but in this example I lit through the outer wall. The light on the upper surface is daylight; I adjusted the shutter-speed to get this to a level I was happy with. I then placed two Speedlight SB-700s behind the shell with their heads almost touching its wall.

Settings

- › Focal length: 100mm
- › Aperture: f/16
- › Shutter speed: 1/15 sec.
- › ISO: 500



5 CLOSE-UP

Most photography is about capturing what you can see with the naked eye, but close-up photography goes beyond this, entering into a whole new world (or at least a new way of seeing the world). For many, its fascination can last a lifetime.

For close-up photography, DSLRs such as the Df now reign supreme: the choice of reflex viewing and Live View gives the best of both worlds. The Df is also part of the legendary Nikon system of lenses and accessories, which offers many additional options for close-up photography.

Depth of field is a key issue in close-up photography. As you move closer to the subject, depth of field becomes ever narrower, which has several consequences.

First, it's often necessary to stop down to small apertures, which can make long exposures essential. Second, the slightest movement of either subject or camera can ruin the focus. For both of these reasons a tripod or other solid camera support is often required, and it may also be necessary to prevent the subject from moving (within ethical limits, of course!).

Because depth of field is so shallow, focusing becomes critical. Merely focusing



SMALL WORLDS

Potential close-up subjects are everywhere, and close-up/macro photography encourages us to look and see.

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on “the subject” is no longer adequate and you may have to decide which part of the subject—an insect’s eye or the stamen of a flower, for example—should be the point of sharp focus.

With 39 AF points the Df can focus accurately within much of the frame, but close-up photography is also an area where Live View mode comes into its own. By selecting Wide area AF or Normal area AF, the focus point can be set anywhere in the frame.

If you prefer to use manual focus, the zoomable view in Live View mode also makes this ultra-precise. For years I was a “Live View Luddite,” but now it’s my first

choice for macro photography, at least with static subjects. In Live View, manual focus is both quicker and more intuitive.

Tip

To ensure that you’re as close to the subject as you can possibly get, use manual focus and set the lens to its minimum focusing distance. Don’t touch the focus control again: instead, move either the camera or subject until the image is sharp. This may seem slow, but it guarantees that you’re as close as your lens will allow.

DEPTH OF FIELD »

This image exemplifies the minimal depth of field obtained in extreme close-up shooting. The bee’s wings are almost parallel to the camera and largely sharp, but the rest of its body and limbs are blurred.



There's no exact definition of "close-up," but the term "macro" really should be used more precisely. Strictly speaking, macro photography means imaging objects at life-size or larger, implying that a true macro lens should allow a reproduction ratio of at least 1:1. Many zoom lenses are badged "macro" when their reproduction ratio is around 1:4, or 1:2 at best. While this still allows a great deal of fascinating close-up photography, it isn't macro in the classical definition.

However, you don't necessarily need to go to the expense of a dedicated macro

lens to explore true macro photography—as you will see in this chapter there are many possibilities open to you.

› Reproduction ratio

The reproduction ratio (or image magnification) is the ratio between the actual size of the subject and the size of its image on the Df's sensor. The sensor measures 36 x 23.9mm and therefore an object of these dimensions captured at a reproduction ratio of 1:1 would exactly fill the image frame.

To take an example that every Nikon Df user has to hand, an SD memory card (measuring 32 x 24mm) would not quite span the long axis of the frame, but would fill the short axis when photographed at 1:1 or "life size."

Of course, when the image is printed or displayed on a computer screen it may appear many times larger than life, but that's another story.



REPRODUCTION RATIO

The first shot (above) shows the closest view achieved with a "normal" 24-85mm zoom lens (giving a reproduction ratio of approximately 1:2). The second shot (left), was taken with a 100mm macro lens at its closest possible focusing distance. This gives approximately life size (1:1) reproduction.

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› Working distance

The working distance is the distance required to obtain the desired reproduction ratio with any given lens. It is obviously related to the focal length of the lens: with a 200mm macro lens, the working distance for 1:1 reproduction is double that of a 100mm lens. This extra distance can be especially useful when photographing living subjects, particularly mobile ones. It can also be helpful with delicate subjects (living or not), which might be damaged by accidental contact.

For any given lens, if you want to fill the frame with a subject, the working distance will be shorter with an FX format camera like the Df than with a DX format camera such as the D7100. If a greater working distance is needed, and no alternative lens is available, switching **Image area** to **DX** is a possibility. The resulting images will

be approx. 6.6 megapixels, which is still more than adequate for most purposes, including virtually all forms of on-screen or online viewing.

Tip

Working distance and the minimum focus distance of a lens are normally measured from the subject to the focal plane, which equates to the position of the sensor. A 10-inch (25cm) working distance therefore means that the subject—or the bit of the subject you're focusing on—can be less than 4 inches (10cm) from the front of the lens. Accessories such as a lens hood or ringflash can narrow this gap even further.



MACRO SETUP

Observe how close the front of the lens is to the subject—and you have to get light in there somehow! A ring-light is a good solution, but could easily touch some of the leaves of the plant.

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Many fine close-up and macro shots can be taken using available light, but you'll often find that your own shadow, or the camera's, can intrude. Some subjects (such as the interiors of flowers) can create their own shadows too, so for these and other reasons you will soon start to want more controlled lighting.

This usually means using flash, but regular Speedlights are not designed for ultra-close work, at least not when they are mounted in the camera's hotshoe. Specialist macro flash units usually take the form of either a ringflash or twin-flash. At these operating distances they do not need high power and can be relatively light and compact.

Ringflash units encircle the lens, providing consistent illumination even on ultra-close subjects (they're also favored by some portrait photographers). Nikon no longer makes a ringflash, but alternatives come from manufacturers such as Sigma and Nissin.

Nikon favors a twin-flash approach, with its Speedlight Commander Kit R1C1 and Speedlight Remote Kit R1. Both use two Speedlight SB-R200 flashes, which are mounted either side of the lens. The R1C1 uses a Wireless Speedlight Commander SU-800 unit that fits into the camera's hot shoe, while the R1 requires a separate Speedlight to act as a "commander."

These kits are expensive, but give very flexible and precisely controllable light on macro subjects.

› LED light

An alternative is to use LED lights, such as the Sunpak LED Macro Ring Light. Its continuous output allows you to preview the image in a way that is not possible with flash. However, its low power limits it to close (and usually static) subjects.

Df AND SUNPAK LED MACRO RING LIGHT





RING LIGHT

This shot was taken using a Sunpak LED Macro Ring Light (shown opposite). It provides an even, almost shadowless illumination on the subject. This would have been quite tricky by any other means as some leaves were actually overlapping the front of the lens.

› Improvisation

Dedicated macro flash units aren't cheap, and may be unaffordable or unjustifiable when you just want a taste of macro work. Fortunately, you can do lots with a standard flash and a flash cord. With a basic flash unit you will lose the Df's advanced flash control, but it only takes a few test shots to establish settings that you can use repeatedly (especially if you keep notes!).

A small reflector, such as a piece of white card, is essential: place it really close to the subject for maximum benefit. This system—a single flash used off-camera and a reflector—can be very flexible and can deliver very polished results.

I've also found that a flash diffuser, such as the Honl (see page 167), can give excellent results—on small subjects it gives a really good spread of light.



REFLECTED LIGHT

The first of these shots (left) used an SB-700 Speedlight, off the camera and to the left. For the second shot (right) a sheet of white card was placed just out of shot to the right of the camera, to bounce light back into the shadows.

› Extension tubes

Extension tubes are a simple and relatively inexpensive way of extending the close-focusing capabilities of a lens. An extension tube is essentially a simple tube that fits between the lens and the camera. This decreases the minimum focusing distance and thereby increases the magnification factor. As with close-up attachment lenses (see right) they are light, compact, and easy to carry and use.

The Nikon system includes four Extension tubes: PK-11A, PK-12, PK-13, and PN-11. These extend the lens by 8mm, 14mm, 27.5mm, and 52.5mm respectively.

The basic design of these tubes has not changed for many years, which means that

Warning!

Some recent lenses are incompatible with accessories such as extension rings, bellows, and teleconverters, so always check the lens manual before using (or purchasing) them.

many of the camera's functions are not available. In particular, there's no autofocus, although third-party manufacturer, Kenko, also produces compatible extension tubes, which *do* support autofocus. They're also considerably less expensive than Nikon's own offerings.

› Close-up attachment lenses

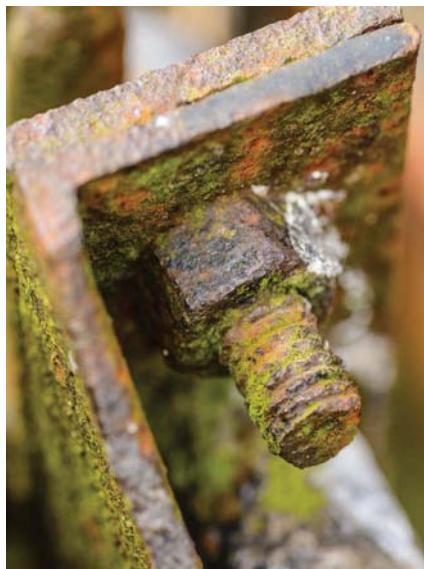
Close-up attachment lenses are simple magnifying lenses that screw into the filter thread of a regular lens. They are light, convenient, and inexpensive, and fully compatible with the camera's exposure and focusing systems. For best results, it's recommended to use them with prime lenses. Nikon produces six close-up attachment lenses, as detailed below.

Close-up lens	Attaches to filter thread	Recommended for use with
0, 1	52mm	Standard lenses
3T, 4T	52mm	Short telephoto lenses
5T, 6T	62mm	Telephoto lenses

› Bellows

As with extension tubes, bellows increase the distance between the lens and the camera body, enabling closer focusing, but they are not restricted to a few set lengths. Again, there's no extra glass to impair optical quality, but bellows are expensive, heavy, and take time to set up: because of this they are usually employed in a studio or other controlled setting.

Nikon's PB-6 bellows offers extensions from 48mm to 208mm, giving a maximum reproduction ratio of about 11:1. Focusing and exposure is manual only.



› Reversing rings

Also known as reverse adapters or inversion rings, these allow lenses to be mounted in reverse; the adapter screws into the filter thread. This allows much closer focusing than when the lens is used normally. They are ideally used with a prime lens, such as the classic 50mm f/1.8. Nikon's Inversion ring BR-2A fits a 52mm filter thread, but numerous third-party options are available.

Note:

Because accessories such as extension tubes and bellows increase the effective length of the lens, they also increase the effective focal length. However, the physical size of the aperture does not change. The result is that the attached lens becomes "slower"—that is, a lens with a maximum aperture of f/2.8 may behave like an f/4 or f/5.6 lens. This makes the viewfinder image dimmer than normal and also affects the exposure required. The camera's metering will accommodate this, but you may need a longer shutter speed or more light. Reversing rings do not have this effect.

CLOSE-UP ACCESSORIES

Accessories such as close-up attachment lenses and reversing rings enable serious close-up photography at minimal cost

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» MACRO LENSES

True macro lenses achieve reproduction ratios of 1:1 or better. They are optimized optically for close-up work, although they are also usually very capable for general photography too. This is certainly true of Nikon's Micro Nikkor lenses, of which there are currently five. Two of them are DX lenses, but they should not be ruled out automatically because of this.

You should also not rule out third-party lenses from the likes of Sigma, Tamron, and Tokina—all of the close-up illustrations in this book were taken using a 100mm Tokina macro lens, for example.



60MM F/2.8G ED AF-S MICRO NIKKOR



The **60mm f/2.8G ED AF-S Micro Nikkor** is an upgrade to the previous 60mm f/2.8D. Advances include ED glass for superior optical quality and a Silent Wave Motor for ultra-quiet autofocus.



105MM F/2.8G AF-S VR MICRO NIKKOR



The **105mm f/2.8G AF-S VR Micro Nikkor** also features internal focusing, ED glass, and a Silent Wave Motor, but its main claim to fame is as the world's first macro lens with built-in VR (Vibration Reduction). As the slightest camera shake is magnified at high reproduction ratios, technology designed to combat its effects is extremely welcome, allowing you to employ shutter speeds up to four stops slower than would otherwise be possible. However, it can't compensate for movement of the subject. Remember, too, that at close range the slightest change in the subject-to-camera distance can completely ruin the focus, so a tripod is still invaluable.

The **200mm f/4D ED-IF AF Micro Nikkor** is an older design, but its longer working distance is particularly suited to photographing the animal kingdom.

If you are happy using DX crop mode, there are also two Micro Nikkor lenses engineered specifically for the DX format.

For dipping your toe into the waters of macro photography, the **40mm f/2.8G AF-S DX Micro Nikkor** has the attraction of being Nikon's lightest and least expensive macro lens. Be aware,

however, that its working distance at a 1:1 reproduction ratio is just over 6 inches (16cm), leaving very little room between the subject and the front of the lens.

The **85mm f/3.5G ED VR AF-S DX Micro Nikkor** is a more versatile focal length, with internal focusing, ED glass, and a Silent Wave Motor.



40MM F/2.8G AF-S DX MICRO NIKKOR

❖ **85MM F/3.5G ED VR AF-S DX MICRO NIKKOR** ❖



5

» CHRISTMAS ANGEL

If this looks like a simple shot of a Christmas tree, I'm happy, but it took some setting up. I used two Speedlights, one with an orange filter at the right and one with a blue filter at the left. The picture still seemed a bit empty so I placed an extra string of colored lights behind the tree.



Settings

- › Focal length: 100mm
- › Shutter speed: 1/60 sec.
- › Aperture: f/11
- › ISO: 200

» ORCHID

A favorite subject of mine, but still challenging. The main light was a flash placed below, behind, and to the left, so that the structures of the flower were backlit. A second flash, at a lower power, was held at a 45-degree angle above the bloom to fill in the shadows.

Settings

- › Focal length: 100mm
- › Shutter speed: 1/125 sec.
- › Aperture: f/16
- › ISO: 500



6 LENSES

There are many reasons for choosing a DSLR such as the Df over a compact camera. One of the most important is the ability to choose from a vast range of lenses, which includes Nikon's own legendary system as well as lenses from other makers.

Nikon's F-mount lens mount is now—in its basic form—over 50 years old. However, unlike other manufacturers, a philosophy of continuity of design means that most of these Nikkor lenses will still work on most

Nikon DSLRs (albeit sometimes with major limitations). The Df is unusual in that it is also able to accept early, pre-Ai lenses that

Df WITH 12-24MM LENS



should not be used on other Nikon DSLRs as they can damage the camera.

However, there are still sound reasons why the best lenses for the camera are among the more recent range. One obvious reason is that many older lenses lack a CPU (central processing unit), so many automatic functions are unavailable, including autofocus with totally manual pre-Ai and Ai lenses.

Older lenses can also only be used in Aperture Priority and Manual exposure modes, although if you started out with an all-manual 35mm Nikon SLR such as the FM2 (as I did), then even Aperture Priority can seem like a luxury!

It's refreshing, and perhaps educational, to go back to older and perhaps more considered ways of working, but lens design has not stood still in the half-century lifespan of Nikon's F-mount. Older prime lenses often stand up well in terms of sharpness and distortion, but modern

lens coatings are far better at controlling flare. Older zoom lenses are rarely great optical performers and often feel heavy and unwieldy too.

Another reason for preferring lenses designed specifically for digital cameras relates to the way that light reaches the individual photodiodes or "photosites" on the camera's sensor. Because these are slightly recessed, there can be some cut-off if light hits them at an angle. This is less critical with 35mm film, for which older Nikkor lenses were designed, but newer lenses are designed specifically to make sure that light hits the sensor as close to perpendicular as possible, maintaining illumination and image quality right across the frame.

Many older lenses can still be used, and will often give very good results, but critical examination may show some loss of brightness toward the edges of the frame, and perhaps a hint of chromatic aberration (color fringing). Wide-angle lenses are most susceptible, telephotos less so, but how noticeable this is will also depend on the size of print or reproduction you require. These shortcomings can, to some extent, be corrected in post-processing (especially if you shoot Raw files).

Tip

There are just a few older lenses that cannot be used with the Df. All are rare and esoteric and pretty much any "normal" Nikkor lens is safe. There is a comprehensive list in the Df manual.

Nikon's lens range has long been renowned for its technical and optical excellence, and many lenses incorporate special features or innovations. As these are

referred to extensively on pages 200–205 (and elsewhere in this chapter), brief explanations of the main terms and abbreviations are given here.

Abbreviation	Term	Explanation
AF	Autofocus	Lens focuses automatically. The majority of current Nikkor lenses are AF, but a substantial manual focus range remains.
AF-S	AF-S	AF lens with built-in Silent Wave Motor (see opposite).
Ai (and Ai-S)	Automatic maximum aperture indexing	Manual focus lens that has a physical coupling to communicate aperture information from the lens to the camera.
ASP	Aspherical lens elements	Precisely configured lens elements that reduce certain aberrations. Especially useful in reducing distortion with wide-angle lenses.
CRC	Close-range correction	Advanced lens design that improves picture quality at close focusing distances.
D	Distance information	D-type and G-type lenses communicate information to the camera about the distance at which they are focusing, supporting functions such as 3D matrix metering.
DC	Defocus-image control	Found in a few lenses aimed mostly at portrait photographers; allows control of aberrations and thereby the appearance of out-of-focus areas in the image.
DX	DX lens	Lenses specifically designed for DX format digital sensors: will not give full-frame coverage on 35mm cameras or on FX format DSLRs such as the Df.

G	G-type lens	Modern Nikkor lens with no aperture ring. Aperture must be set by the camera (automatically in P and S modes; via sub-command dial in A and M).
ED	Extra-low dispersion glass	ED glass minimizes chromatic aberration (the tendency for light of different wavelengths to be focused at slightly different points).
IF	Internal focusing	Only internal elements of the lens move during focusing, so the front element does not extend or rotate.
M/A	Manual/Auto	Most Nikkor AF lenses offer M/A mode, which allows for a seamless transition from automatic to manual focusing if required.
N	Nano crystal coat	A lens coating said to virtually eliminate internal reflections, guaranteeing minimal flare.
Non-Ai/Pre-Ai	Non-Ai/Pre-Ai	Original F-mount Nikon lenses, pre-dating Ai.
PC	Perspective control	See page 198.
RF	Rear focusing	Lens design where only the rear elements move during focusing: makes AF operation faster.
SIC	Super Integrated Coating	Nikon-developed lens coating that minimizes flare and “ghosting.”
SWM	Silent Wave Motor	Special in-lens motor that delivers very fast and very quiet autofocus operation.
VR	Vibration Reduction	System that compensates for camera shake. VR is said to allow handheld shooting up to 3 stops slower than would otherwise be possible (so 1/15 sec. instead of 1/125 sec., for example). More recent lenses feature VR II, which is said to offer a gain of 4 stops (1/8 sec. instead of 1/125 sec., for example). The latest iteration of VR (VR III) increases this to 5 stops (so 1/4 sec. instead of 1/125 sec., for example).

Though familiar, the term “focal length” is often misapplied. The focal length of any lens is a basic optical characteristic, and fitting the lens to a different camera does not change it: a 20mm lens is a 20mm lens, no matter what.

However, what is often called the “effective focal length” can and does change. I can fit the same lenses to the FX format Df or to a DX format D7100, but the results are different because the Df’s larger

sensor “sees” more of the image that the lens projects.

The FX format has a near-identical image area to a standard frame of 35mm film. On an FX format sensor and on 35mm film the true focal length and

CROP FACTOR

The area covered by a DX lens (a Nikkor 18–70mm) compared to the DX crop area (shown in red). Other DX lenses may even have wider coverage.



the effective focal length are the same. However, on DSLRs with smaller sensors, such as the DX format of the D7100, the *effective* focal length is longer (although by convention we still use the true focal length to describe the lenses we use). One implication is that if someone tells you they took a particular shot with, say, a 200mm lens, you also need to know the format of the camera they used.

To confuse things further, the same convention is rarely followed when talking about digital compact cameras. Most of these have much smaller sensors and the true focal lengths of their lenses are very much shorter. Yet they are nearly always described by their effective focal length, or "35mm equivalent."

› Crop factor

As you've just seen, the D7100 has a smaller sensor than the FX/35mm standard. This creates a crop factor, also referred to as focal length magnification factor, of 1.5. The same applies to using the Df's DX crop mode (p71).

This mode usually activates automatically when a DX lens is fitted, but it can also be activated manually. If you use DX crop with a 200mm lens, the field of view is equivalent to using a 300mm lens on a full-frame camera. This is handy for sports and

wildlife, allowing long-range shooting with relatively light and inexpensive lenses, as well as reducing file sizes.

Tip

Some DX lenses cover a wider area than the strict DX crop, and this gives you the option to obtain larger images with them: set Auto DX crop to Off, then crop the images afterward to get rid of the darkened corners. You can do this using Trim in the Retouch menu, or in any image-editing app on a computer or tablet. On the other hand, using DX-crop can make framing more intuitive, and is handy if you want to use the images right away.

› Field of view

The field of view, or angle of view, is the area covered by the image frame. While the focal length of a lens remains the same on any camera, the angle of view seen in the image is different for different sensor formats. The angle of view is usually measured across the diagonal of the frame.



12mm



24mm



50mm



100mm



200mm



300mm

A series of images taken with a Nikon Df from a fixed position, using focal lengths from 12mm to 300mm.

300mm (with DX-crop activated; »
equivalent to 450mm).



» PERSPECTIVE

Perspective concerns the visual relationship between objects at different distances. The apparent fading of distant objects due to haze or scattering of light is known as *atmospheric perspective*, while *optical perspective* refers to changes in apparent size of objects at different distances.

It's often stated that different lenses give a different perspective, but this is wrong: perspective is determined purely by distance. However, different lenses do lend themselves to different working distances, so are often associated with different perspectives. For example, a strong emphasis on the foreground is often called "wide-angle perspective," as a wide-angle lens allows you to move closer to foreground objects.

PERSPECTIVE

In this series of shots, the shifts in distance and focal length are balanced to keep one element the same size, but everything else changes around it. I tried to keep the nearest post the same height in the frame, but there are still radical changes in the apparent shape of the fence and its relationship to the background. From the top: 100mm lens, approx. distance 9m (30ft); 35mm lens, approx. distance 3m (10ft); 12mm lens, approx. distance 1m (3.3ft).

Similarly, the apparent compression of perspective in telephoto shots is a result of the greater working distance with the long lens.



» USING OLDER LENSES

In other books in this series we've included stern warnings about the dangers of using pre-Ai lenses on modern Nikon DSLRs. On the Df, however, these lenses can be used quite safely. Of course, they are manual focus only and you're restricted to Aperture Priority and Manual exposure modes, but within those limits they can deliver excellent results.

In all cases, the aperture must be set using the ring on the lens, not via the sub-command dial and there is one important precaution to be observed (see *Metering coupling lever*, right).

› Recognizing lens types

The main classes of manual focus ("non-CPU") lens are the original F-mount Nikkor lenses, now referred to as pre-Ai or non-Ai, and the later Ai and Ai-S types. All of these lenses have a meter-coupling prong that protrudes above the lens barrel in line with the f/5.6 marking on the aperture ring.

With pre-Ai lenses this prong is solid, apart from the central notch; in Ai/Ai-S lenses two small "windows" perforate it. Pre-Ai lenses also have just one row of aperture numbers marked on the barrel: Ai and Ai-S lenses have a second, smaller row of numerals nearer the lens mount. Pre-Ai lenses can be used safely with the Df, but to get any form of metering it's essential

to specify the lens' details using the **Non-CPU lens data** option in the Setup menu.

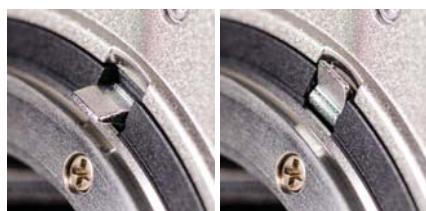
There's no functional difference between Ai and Ai-S lenses in use on the Df, although Ai-S lenses tend to be lighter than their Ai counterparts. Some see this as intelligent use of improved materials, while others see it as a penny-pinching measure that makes these lenses less rugged. Both of these types of lenses can be used without specifying **Non-CPU lens data**, but if you do add this data the lens' functionality is increased.

› Metering coupling lever

Before attaching a pre-Ai lens, you need to raise the metering coupling lever so that it is flush with the camera body (see picture below). It is important to do this to avoid damage to the camera and/or the lens. It is equally important to lower the lever before attaching any other lenses.

Metering coupling
lever—use with
normal use.

Metering coupling
lever—use with
non-Ai lenses.



» LENS ISSUES

› Flare

Lens flare is usually seen when shooting toward the sun or other bright light sources. It is caused by reflections within the lens, and may reveal itself as either a string of colored blobs or a more general “veiling” effect.

Advanced lens coatings help reduce flare, as does keeping lenses and filters clean. Even so, if the sun is directly in shot, some flare may be inescapable. In these instances you can sometimes mask the sun, perhaps behind a tree.

If the sun isn't actually in shot, you can shield the lens. A good lens hood is vital, but may need to be supplemented with a piece of card, a map, or your hand. This is easier when using a tripod; otherwise it requires assistance, or one-handed shooting. Check carefully to see if the flare has gone—and that the shading object hasn't crept into shot!

LENS FLARE

I think the flare in the first shot (above right) can reasonably be described as catastrophic. In the second shot (right), taken slightly earlier and with the sun masked, there's no flare at all.



› Distortion

Distortion makes lines that are straight appear curved in the image. Distortion is usually worst with zoom lenses, especially at the extremes of the zoom range. When straight lines bow outward, it's called barrel distortion; when they bend inward, it's pincushion distortion. Distortion often

goes unnoticed when shooting natural subjects with no straight lines, but it can rear its ugly head when level horizons appear in landscape or seascape images.

Distortion can be corrected using **Auto Distortion Control** from the Shooting menu (for compatible lenses), or rectified later using **Distortion Control** from the Retouch menu or in post-processing. All of these methods will crop the image slightly.

› Chromatic aberration

Chromatic aberration occurs when different wavelengths of light are brought to focus at slightly different distances on the sensor. It appears as colored fringing when images are examined closely. The Df has built-in correction for chromatic aberration during processing, but this applies only to JPEG and TIFF images. Chromatic aberration can also be corrected in post-processing (with Raw images this is the only option).



DISTORTION

The barrel distortion in this shot was exaggerated in post-processing. Despite this, it remains undetectable in the curves and natural forms of the foreground. However, it is all too obvious in the buildings.

«

› Vignetting

Vignetting is a darkening toward the corners of the image, which is most conspicuous in even-toned areas such as clear skies. Most lenses show slight vignetting at maximum aperture, but it should reduce on stopping down the aperture. The Df has built-in vignette control (see page 107), but this applies only to JPEG and TIFF images. It can also be tackled during post-processing. Severe vignetting can arise if you use unsuitable lens hoods and filter holders, or “stack” multiple filters on the lens.

› Lens care

Lenses require special care. Glass elements and coatings are easily scratched and this will degrade your images. Remove dust and dirt with a blower; fingerprints and other marks should be removed using a dedicated lens cleaner and optical grade cloth. A skylight or UV filter will help protect the lens, and lens caps should be replaced when a lens is not in use.

VIGNETTING

Vignetting is seen most clearly in areas of even tone.



› Standard lenses

In traditional 35mm photography (and full-frame digital photography) a 50mm focal length is considered “standard,” as its field



of view approximates that of the human eye. In most markets the Df is supplied as a kit with a 50mm f/1.8 lens.

Standard lenses are typically light, simple, and have wide maximum apertures. Zoom lenses whose range includes the 50mm focal length are often referred to as “standard zooms.”



50MM F/1.8G AF-S NIKKOR



STANDARD LENS

With a field of view approximating that of the human eye and a fast maximum aperture, a standard lens makes a good “walk-around” lens.



› Wide-angle lenses

A wide-angle lens is really any lens with a focal length wider than a standard lens; for the Df this means any lens shorter than 50mm. Wide-angle lenses are useful for working close to subjects or bringing foregrounds into greater prominence. They lend themselves both to photographing expansive scenic views and to working in cramped spaces where you can't step back to "get more in."

Because of the crop factor of DX format cameras, a lens such as a 17mm, which was once regarded as "super-wide," gives a less extreme angle of view. Although this does not apply on the Df, it has had an impact in promoting the development of a new



14-24MM F/2.8G ED AF-S NIKKOR



breed of even wider lenses, such as Nikon's 14-24mm f/2.8G ED AF-S. The Sigma 12-24mm F4.5-5.6 II DG HSM has an even wider focal length range and is less than half the price.



WIDE-ANGLE LENS »

A wide-angle lens can produce images that appear far more "dramatic" than a standard focal length.

› Telephoto lenses

Telephoto lenses (often simply called “long lenses”) deliver a narrow angle of view.

They are mostly employed where working distances need to be longer, as in wildlife and sports photography, but have many other uses, such as singling out small and/or distant elements in a landscape.

Moderate telephoto lenses are favored for portrait photography, because the greater working distance gives a natural-looking result and is more comfortable for nervous subjects. The traditional “portrait” focal length range is 85–135mm.

The laws of optics, combined with greater working distances, mean depth of field is limited with telephoto lenses. This is often beneficial in portraiture, wildlife, and sports photography, as it concentrates attention on the subject by throwing the background out of focus. It can be less welcome in landscape shooting.



300MM F/2.8G ED VR II AF-S NIKKOR



The size and weight of longer lenses makes them harder to handheld comfortably, and their narrow angle of view also magnifies any movement: a fast shutter speed and/or the use of a tripod or other camera support is the order of the day. Nikon’s Vibration Reduction (VR) technology also mitigates the effects of camera shake, but it can slow down the maximum frame rate (a factor that sports shooters in particular need to recognize).

Tip

Switch VR OFF when using the camera on a tripod, otherwise it can add shake instead of removing it!

TELEPHOTO LENS



The longer working distance provided by a telephoto lens is ideal when you can’t get physically closer to your subject or don’t want to distract them.

› Zoom lenses

The term “zoom” refers to a lens that contains a range of focal lengths, such as the 70–200mm f/4G ED AF-S VR III Nikkor. A zoom lens can replace a bagful of prime lenses and cover the gaps in between, scoring highly for weight, convenience, and economy. Flexible focal length also allows very precise framing.

While once considered inferior in optical quality, there is now little to choose between a good zoom and a good prime lens, at least in terms of general sharpness and contrast. Most zoom lenses will have a “sweet spot” in the zoom range where distortion is minimal, but many show discernible barrel distortion at wide-angle settings and pincushion distortion at longer focal lengths.

Cheaper or older zooms, and those with a very wide range—18–200mm or 28–300mm, for example—may still be compromised optically, and usually have a relatively small (“slow”) maximum aperture.



70-200MM F/4G ED AF-S VR III NIKKOR



ZOOM

A single zoom lens can replace multiple prime lenses, making it the ideal choice when you want or need to travel light.



› Macro lenses

For specialist close-up work there is little to beat a true macro lens: for more on these see page 178.

CLOSE-UP

A dedicated macro lens is optimized for close-up photography, with most giving you 1:1 (“life size”) reproduction.



› Perspective control lenses

Perspective control (or “tilt and shift”) lenses give unique flexibility in viewing and controlling the image. Their most obvious application is photographing architecture.

With a “normal” lens it often becomes necessary to tilt the camera upward, resulting in converging verticals (where buildings appear to lean back or even to one side). The shift function of a PC lens allows the back of the camera to be kept vertical, which in turn means that vertical lines in the subject remain vertical in the image. Tilt movements also allow extra control over depth of field, whether to extend it or to minimize it.

The current Nikon range features three PC lenses, with focal lengths of 24mm, 45mm, and 85mm. They retain many automatic functions, with the exception of focusing: all three are manual focus only.

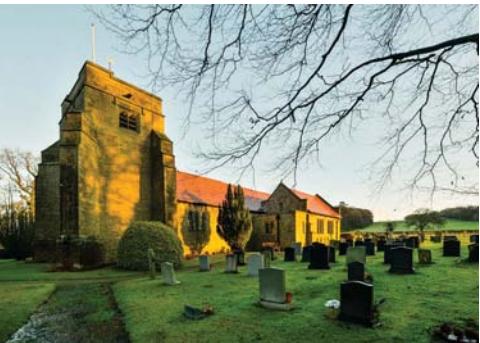


24MM F/3.5D ED PC-E NIKKOR



DIGITAL CORRECTION

A 24mm PC lens wasn't wide enough in this small churchyard, so I used a 14mm prime lens and then performed the perspective correction in Lightroom.



› Teleconverters

Teleconverters are supplementary optics that fit between the main lens and the camera body to magnify the focal length of the main lens. Nikon currently offers the TC-14E II (1.4x magnification), TC-17E II (1.7x magnification), and TC-20E II (2x magnification) teleconverters.

The advantages of using a teleconverter are obvious: it allows you to extend your focal length range with minimal additional weight (the TC-14E II, for example, weighs just 7.1 oz./200g).

However, teleconverters can degrade image quality, and as you might expect, the higher the magnification factor of the converter, the more noticeable this is. The TC-20E III, in particular, produces a significant loss of sharpness, especially if you try and shoot at maximum aperture. Results improve when a lens is stopped down to f/8 or f/11, but beyond this, sharpness tails off again due to diffraction.

Teleconverters also cause a loss of light: fitting a 2x converter loses 2 stops of light, for example. As well as requiring you to increase the shutter speed or ISO, the camera's autofocus may become sluggish or only work with the central focus points.

TELECONVERTER

Using a 2x teleconverter with a 200mm lens provided me with a 400mm focal length to get close to my flighty subject.



AF-S TELECONVERTER TC-20E III



Warning!

Some lenses are incompatible with Nikon's teleconverters, so check carefully before use.



This grid lists currently available Nikkor autofocus lenses. DX-series lenses, which do not cover the full sensor area of the Df, are listed last. The angle of view quoted for DX lenses is the effective angle of view on the DX frame area. For an explanation of abbreviations see p184.

Optical features/notes

AF Prime lenses

14mm f/2.8D ED AF	ED, RF
16mm f/2.8D AF Fisheye	IF
20mm f/2.8D AF	CRC
24mm f/1.4G ED	ED, SWM, NC
24mm f/2.8D AF	
28mm f/1.8G AF-S	NC, SWM
28mm f/2.8D AF	
35mm f/2D AF	
35mm f/1.8G AF-S	RF, SWM
35mm f/1.4G AF-S	NC, SWM
50mm f/1.8G AF-S	SWM
50mm f/1.8D AF	
50mm f/1.4D AF	
50mm f/1.4G AF-S	IF, SWM
58mm f/1.4G AF-S	NC, SWM
85mm f/1.4G AF	IF, SWM, NC
85mm f/1.8D AF	RF
85mm f/1.8G AF-S	IF, SWM
105mm f/2D AF DC	DC
135mm f/2D AF DC	DC
180mm f/2.8D ED-IF AF	ED, IF
200mm f/2G ED-IF AF-S VR II	ED, VR II, SWM
300mm f/4D ED-IF AF-S	ED, IF
300mm f/2.8G ED VR II AF-S	ED, VR II, NC, SWM

Angle of view on FX format sensor	Min. focus distance (m)	Filter size (mm)	Dimensions diameter x length (mm)	Weight (g)
114	0.2	Rear	87 X 86.5	670
180	0.25	Rear	63 X 57	290
94	0.25	62	69 x 42.5	270
84	0.25	77	83 x 88.5	620
84	0.3	52	64.5 x 46	270
74	0.25	67	73 x 80.5	330
74	0.25	52	65 x 44.5	205
63	0.25	52	64.5 x 43.5	205
63	0.25	58	72 x 71.5	305
63	0.3	67	83 x 89.5	600
46	0.45	58	72 x 52.5	185
46	0.45	52	63 x 39	160
46	0.45	52	64.5 x 42.5	230
46	0.45	58	73.5 x 54	280
40.5	0.58	72	85 x 70	385
28.5	0.85	77	86.5 x 84	595
28.5	0.85	62	71.5 x 58.5	380
28.5	0.8	67	80 x 73	350
23.3	0.9	72	79 x 111	640
18	1.1	72	79 x 120	815
13.6	1.5	72	78.5 x 144	760
12.3	1.9	52	124 x 203	2900
8.1	1.45	77	90 x 222.5	1440
8.1	2.2	52	124 x 267.5	2900

400mm f/2.8G ED VR II AF-S	ED, IF, VR II, NC
400mm f/2.8D ED-IF AF-S	ED, SWM
500mm f/4G ED VR II AF-S	IF, ED, VR II, NC
600mm f/4G ED VR II AF-S	ED, IF, VR II, NC
800mm f/5.6E FL ED VR AF-S	ED, NC, SWM, FL

AF zoom lenses

14–24mm f/2.8G ED AF-S	IF, ED, SWM, NC
16–35mm f/4G ED VR	NC, ED, VR
17–35mm f/2.8D ED-IF AF-S	IF, ED, SWM
18–35mm f/3.5–4.5G ED AF-S	ED, SWM
24–70mm f/2.8G ED AF-S	IF, ED, SWM, NC
24–85mm f/2.8–4D IF AF	IF
24–85mm f/3.5–4.5G ED VR AF-S	ED, VR II, SWM
24–120mm f/4G ED-IF AF-S VR II	ED, SWM, NC, VR II
28–300mm f/3.5–5.6G ED VR	ED, SWM
70–200mm f/2.8G ED-IF AF-S VR II	ED, SWM, VR II
70–200mm f/4G ED AF-S VR III	ED, IF, SWM, NC, VR III
70–300mm f/4.5–5.6G AF-S VR II	ED, IF, SWM, VR II
80–400mm f/4.5–5.6D ED VR AF-S	ED, VR, NC
200–400mm f/4G ED-IF AF-S VR II	ED, NC, VR II, SWM

Macro lenses

60mm f/2.8G ED AF-S Micro	ED, SWM, NC
105mm f/2.8G AF-S VR II Micro	ED, IF, VR II, NC, SWM
200mm f/4D ED-IF AF Micro	ED, CRC

Angle of view on FX-format sensor	Min. focus distance (m)	Filter size (mm)	Dimensions diameter x length (mm)	Weight (g)
6.1	2.9	52	159.5 x 368	4620
6.1	3.8	52	160 x 352	4800
5	4	52	139.5 x 391	3880
4.1	5	52	166 x 445	5060
3.1	5.9	52	160 x 461	4590
<hr/>				
114-84	0.28	None	98 x 131.5	970
107-63	0.29	77	82.5 x 125	680
104-63	0.28	77	82.5 x 106	745
100-63	0.28	77	83 x 95	385
84-34.3	0.38	77	83 x 133	900
84-28.5	0.5	72	78.5 x 82.5	545
84-28.5	0.38	72	78 x 82	465
84-20.5	0.45	77	84 x 103.5	710
75-8.1	0.5	77	83 x 114.5	800
34.3-12.3	1.4	77	87 x 209	1540
34.3-12.3	1	67	78 x 178.5	850
34.3-8.1	1.5	67	80 x 143.5	745
30.1-6.1	2.3	77	95.5 x 203	1570
12.3-6.1	2	52	124 x 365.5	3360
<hr/>				
39.6	0.185	62	73 x 89	425
23.5	0.31	62	83 x 116	720
12.3	0.5	62	76 x 104.5	1190

Perspective control

24mm f/3.5D ED PC-E	ED, NC, manual focus
45mm f/2.8D ED PC-E	ED, NC, manual focus
85mm f/2.8D ED PC-E	ED, NC, manual focus

DX lenses (Angle of view assumes DX crop in effect)

10.5mm f/2.8G DX Fisheye	CRC
10–24mm f/3.5–4.5G ED AF-S DX	ED, IF, SWM
12–24mm f/4G ED-IF AF-S DX	SWM
16–85mm f/3.5–5.6G ED VR II AF-S DX	VR II, SWM
17–55mm f/2.8G ED-IF AF-S DX	ED, IF, SWM
18–55mm f/3.5–5.6G VR II AF-S DX	VR II, SWM, Retractable
18–55mm f/3.5–5.6G AF-S VR II DX	VR, SWM
18–70mm f/3.5–4.5G ED-IF AF-S DX	ED, SWM
18–105mm f/3.5–5.6G ED VR II AF-S DX	ED, IF, VR II, NC, SWM
18–140mm f/3.5–5.6G ED VR II AF-S DX	ED, IF, VR II, SWM
18–200mm f/3.5–5.6G ED AF-S VR II DX	ED, SWM, VR II
18–300mm f/3.5–5.6G ED VR II AF-S DX	ED, IF, SWM, VR II
35mm f/1.8G AF-S	SWM
40mm f/2.8G AF-S DX Micro	SWM
55–200mm f/4–5.6 AF-S VR DX	ED, SWM, VR
55–200mm f/4–5.6G ED AF-S DX	ED, SWM
55–300mm f/4.5–5.6G ED VR	ED, SWM
85mm f/3.5G ED VR II AF-S DX Micro	ED, IF, SWM, VR II

Angle of view on FX-format sensor	Min. focus distance (m)	Filter size (mm)	Dimensions diameter x length (mm)	Weight (g)
84	0.21	77	82.5 x 108	730
51	0.25	77	83.5 x 112	780
28.4	0.39	77	82.7 x 107	650
<hr/>				
180	0.14	Rear	63 x 62.5	300
109–61	0.24	77	82.5 x 87	460
99–61	0.3	77	82.5 x 90	485
83–18.5	0.38	67	72 x 85	485
79–28.5	0.36	77	85.5 x 11.5	755
76–28.5	0.28	52	66 x 59.5 (retracted)	195
76–28.5	0.28	52	73 x 79.5	265
76–22.5	0.38	67	73 x 75.5	420
76–15.3	0.45	67	76 x 89	420
76–11.5	0.45	67	78 x 97	490
76–8	0.5	72	77 x 96.5	560
76–5.3	0.45	77	83 x 120	830
44	0.3	52	70 x 52.5	210
38.5	0.163	52	68.5 x 64.5	235
28.5–8	1.1	52	73 X 99.5	335
28.5–8	0.95	52	68 X 79	255
28.5–5.2	1.4	58	76.5 x 123	530
18.5	0.28	52	73 X 98.5	355

ACCESSORIES

DSLRs are system cameras. As well as lenses and flash units, there are many other accessories that can extend the capabilities of the camera. Nikon's system is huge, and third-party suppliers offer even more options.

» FILTERS

Some types of filter are redundant with digital cameras: variable white balance has largely eliminated the need for color-correction filters, for example, which were once essential for recording color accurately on film, especially positive (transparency) film.

As a general principle, you should avoid using filters unnecessarily. Adding extra layers of glass in front of your lens can increase flare or otherwise degrade the image. There is one exception, however: keeping a UV or skylight filter attached permanently to each lens you own provides a first line of defence against knocks and scratches.

› Types of filter

Filters can attach to the lens in several ways. The most familiar type is circular filters that screw to the front of the lens. The filter-thread diameter (in mm) of most Nikon lenses is specified in the lens listings on pages 200–205. It is usually marked around the front of the lens next to a Ø symbol. Nikon produces high-quality filters

in sizes matching the range of Nikkor lenses, while larger ranges come from filter makers such as Hoya and B+W.

If you use filters extensively, you'll find that slot-in filters are more economical and convenient. The square or rectangular filters fit into a slotted holder and one holder and one set of filters can serve many lenses: you just need a simple adapter ring for each.

A few specialist lenses, including super-telephotos, extreme wide-angle, and fish-eye lenses, require equally specialist filters that fit either at the rear of the lens or into a slot in the lens barrel.

› UV and skylight filters

Both of these filters cut down ultraviolet (UV) light, which can make images appear excessively blue. A skylight filter also has a slight warming effect. The major benefit of both filters is in protecting the front element of the lens, although dedicated "lens protector" filters are also available for this purpose.

› Polarizing filters

A polarizing filter cuts down reflections from most surfaces, intensifying colors in rocks and vegetation, for example. It can make reflections on water and glass virtually disappear, restoring transparency, and this is impossible to reproduce by any other means, even in post-processing.

A polarizer can also cut through atmospheric haze (although not mist or fog), and make blue skies appear more intense. These effects are strongest when shooting at right angles to the sun, and

vanish when the sun is directly behind or in front of the filter. Rotating the filter also strengthens or weakens its effect.

However, care must be taken when using a polarizing filter with wide-angle lenses, as it is easy for the effect to vary conspicuously across the field of view.

POLARIZED

A good example of uneven polarization: the effect is much stronger at the right side of the frame than at the left.



› Neutral density filters

Neutral density (ND) filters reduce the amount of light reaching the lens, without shifting its color—hence “neutral.”

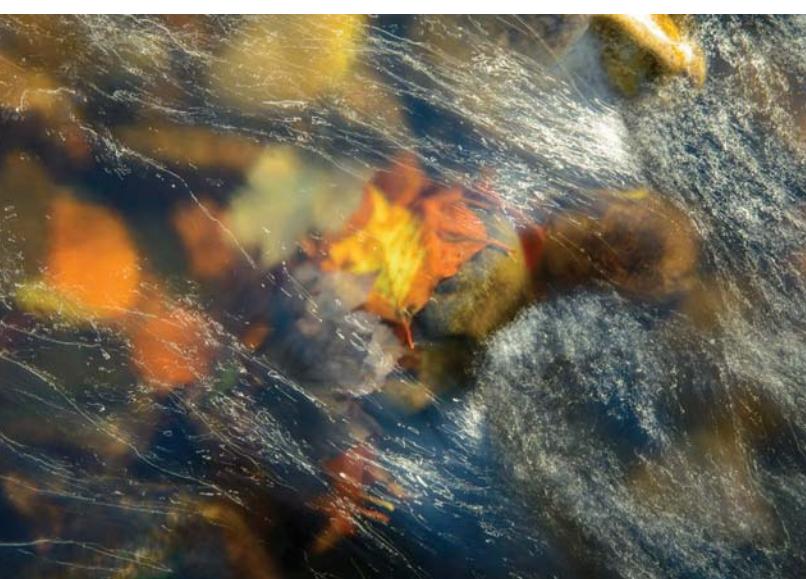
ND filters can be either plain or graduated. A plain ND filter allows you to set slower shutter speeds and/or wider apertures than would otherwise be possible. A classic example is photographing a waterfall, where you may want a slow shutter speed to create a silky blur.

Graduated ND filters have neutral density over half their area. The other half of the filter is clear, with a gradual transition between the two at the center. They are widely used in landscape

photography to compensate for differences in brightness between the sky and land.

Tips

The effect of a graduated ND filter can be unpleasantly obvious, especially when the skyline is irregular, as in a mountain view or cityscape. There are several alternative ways to deal with wide ranges of brightness, including Active D-Lighting (page 90) and HDR imaging (page 94).



NEUTRAL DENSITY «
A plain ND filter is useful when you want to use slow shutter speeds.

› Special effects filters

“Effects” images became very popular in the 1970s, when the Cokin filter system became available to stills photographers. The appeal soon palled, however (although you could argue there’s been a revival with the likes of Instagram).

Soft-focus filters are still used in portrait photography, but have been widely supplanted by post-processing softening techniques. Much the same is true of the “starburst” filter. Indeed, both of these filters can be emulated in-camera, using **Soft** and **Cross Screen** respectively from the **Filter effects** section of the Retouch menu (page 133).

The advantage of capturing an image “straight,” and applying effects through the Retouch menu or in post-processing is that you can always change your mind later on.

EFFECTS

Images like this, with graduated filters creating artificially colored skies, were once popular, but the appeal has waned in recent years.



Nikon includes several items in the box with the camera, but these are really essentials, not extras.

EN-EL14a battery

Without a live battery, your Df is a dead weight. It's always wise to have a fully charged spare on hand, especially in cold conditions or when using the LCD screen extensively. Older EN-EL14 batteries can also be used.

MH-24 charger

Vital for keeping your Df's battery charged.

BF-1A/1B body cap

Protects the interior of the camera when no lens is attached.

› Lens hoods

A lens hood serves two main purposes: it shields the lens against knocks, rain, and other hazards, and it also helps to exclude stray light that could cause flare. Most Nikkor lenses come with a dedicated lens hood, but lens hoods are available separately for those that don't. However, Nikon's lens hoods are disproportionately expensive—third party offerings may be less than half the price.

› Camera cases

Nikon doesn't supply a case with the Df, but unless the camera lives permanently indoors, one should be seen as essential. The most practical is a simple drop-in pouch that can be worn on a waist-belt. Excellent examples come from makers such as Think Tank, Camera Care Systems (CCS), and LowePro.

If you want to carry a larger system, perhaps including several lenses, a flash, and a tripod, then a backpack type bag is kindest on your spine.



BACKPACK »

Backpacks are best for your spine.



POUCH »

A padded pouch (this one's by Think Tank Photo) combines good protection and easy access.

» OPTIONAL ACCESSORIES

A very extensive range of accessories to improve or modify the performance of the Df is available both from Nikon and from third-party suppliers: a small selection is listed here.

Power Connector (EP-5A) and AC Adapter (EH-5B)

This adapter and power connector can be used to power the camera directly from the AC mains. This can be invaluable for shooting without interruption in long studio sessions, for example.

Wireless Mobile Adapter (WU-1a)

This small and relatively inexpensive adapter allows the camera to connect wirelessly to a suitable smartphone or tablet (iOS or Android). For more about wireless connection, see chapter 9.

Wireless Remote Controller (WR-R10/WR-T10 and WR-1)

The combination of WR-R10/WR-T10, or a pair of WR-1s, can be used to control the Df remotely. Third-party units such as Hahnel's Giga T Pro II can give you much of this power at a lower cost. However, none of these controllers let you see what the camera is seeing, or transfer images, which is something that the Wireless Mobile Adapter (WU-1a) and a mobile device can do.

Remote cords and cable releases

Nikon's 1m-long MC-DC2 remote cord can be attached to the terminal in the left side of the Df, allowing you to release the shutter without touching the camera. This helps to minimize vibration.

Alternatively (and uniquely among current Nikon DSLRs), you can use a traditional mechanical cable release that screws into the shutter-release button. Nikon's Cable Release (AR-3) is a natural choice, but you will find plenty of lower cost alternatives available.

Df WITH CABLE RELEASE



GPS units (GP-1 and GP-1A)

Dedicated Global Positioning System devices (see page 229).

Diopter adjustment

The Df's viewfinder has built-in dioptre adjustment (see page 29). If your eyesight is beyond its range, Nikon produces a series of viewfinder lenses with a strength of between -3m^{-1} and $+2\text{m}^{-1}$ (these are designated DK-17C).

However, I find that it's usually easier to wear contact lenses or eyeglasses. My prescription is around -5m^{-1} and I've never had any problem using the Df while wearing contact lenses.

Screen shades

The rear LCD screen on most cameras can be impossible to see properly in bright sunlight. This makes the viewfinder a much better option for framing your shots in these conditions.

However, you will still need the rear LCD screen for Live View and image review, as well as for accessing the Df's menus. Certain third-party companies produce accessory screen-shades (perhaps the best-known name is Hoodman), but if you only need one occasionally you can often improvise with bits of card and some tape.



TRIPOD «

Tripods are ideal for a wide variety of subjects. The light-trail was created as I walked slowly through the scene wearing a head-torch. This also illuminated the foreground.

» CAMERA SUPPORT

› Tripods

There's much more to camera support than tripods, although these remain a staple. VR lenses, plus the Df's exceptional ability to produce fine images at high ISO settings, do encourage handholding, but there are still many occasions where nothing replaces a tripod.

While low weight and low cost always appeal, beware of tripods that simply aren't sturdy enough to provide decent support, especially with longer lenses. The best combination of low weight with good rigidity comes from titanium or carbon fiber tripods. Although they are expensive, a good tripod is an investment that will last for years: my first Manfrotto carbon fiber tripod outlived several cameras and took me from shooting film into the digital age!

› Monopods

Monopods can't equal the ultimate stability of a tripod, but they are light, easy to carry, and quick to set up. They are favored especially by sports photographers, who often need to react quickly while using hefty telephoto lenses.

› Other camera support

There are many other solutions for camera support, both proprietary products and improvised alternatives. It's still hard to beat the humble beanbag, though, which can be bought or homemade.

BEANBAG

A simple homemade beanbag that has served me well for many years. »



› Memory cards

The Df stores images on SD, SDHC, or SDXC cards. On long trips it's easy to fill up even a high capacity memory card, so it's advisable to carry a spare or two.

Memory card performance is measured in two ways. The first is the card's speed rating or rated speed (30MB/s, for example). This is the key measure when shooting stills, especially Raw files.

The second measurement—the card's Class or speed class rating (Class 10, for example)—is more important when shooting video, so not relevant to the Df.

› Backing up on the move

Memory cards rarely fail, but it's always worth backing up valuable images as soon as possible, especially as the Df has only one card slot. Dedicated photo storage devices such as the Vosonic VP8870 and Epson P7000 are increasingly hard to find, as most people (if they back up at all!) now use a laptop, smartphone, or tablet.

› Card care

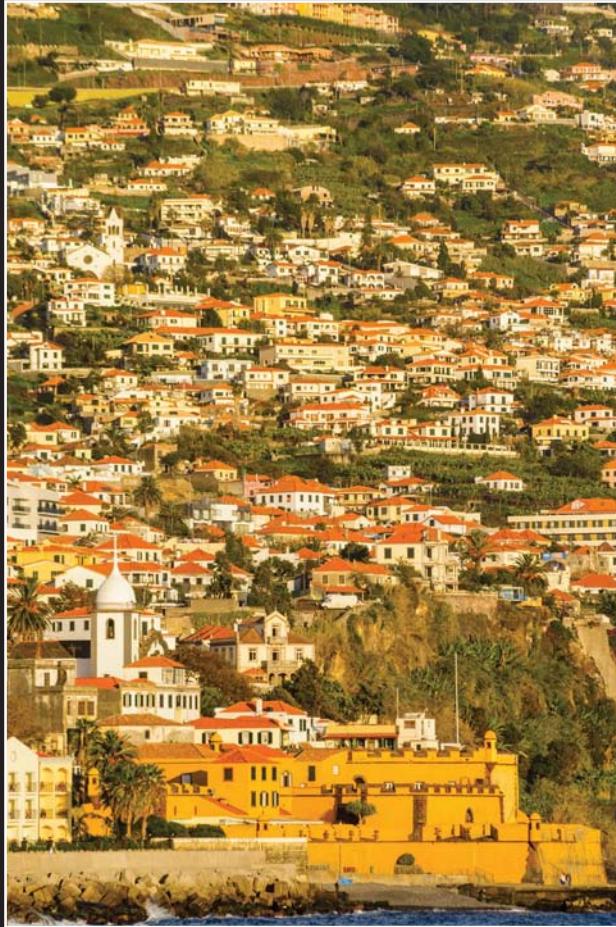
If a memory card is lost or damaged before downloading/backing up, then your images are lost as well. Blank cards may be cheap, but cards full of images are irreplaceable (unlike the camera itself). As SD cards use solid-state memory they are pretty robust, but it's still wise to treat them with care. Keep them in their original plastic cases (or something more substantial) and avoid exposure to extremes of temperature, direct sunlight, liquids, and strong electromagnetic fields.

Note:

There seems to be no evidence that modern airport X-ray machines have any harmful effect on either digital cameras or memory cards.

» STORAGE SPACE

On long trips in particular, the cumulative value of images can be immense, so card care and backup assume even greater importance.



Settings

- › Focal length: 300mm
- › ISO: 200
- › Shutter speed: 1/640 sec.
- › Aperture: f/8

The Df is a rugged camera, but it's also packed with complex and potentially delicate electronic and optical technologies. A few simple precautions should help keep it functioning perfectly for many years.

› Basic care

Keeping your camera clean is fundamental, so you should keep it in a case when it is not in use. Remove dust and dirt with a blower, then wipe with a soft, dry cloth.

The rear screen may be tough enough to survive without a protective cover, but it will need cleaning periodically. Use a blower to remove any loose dirt and then wipe the surface carefully with a clean soft cloth or a swab designed for the purpose. Do not apply pressure and never use household cleaning fluids.

Warning!

Astonishingly, the Nikon manual (page 328) implies that the reflex mirror can be cleaned with a cloth and cleaning fluid. This flies in the face of normal advice: never touch the reflex mirror in any way, as it is extremely delicate. Remove dust from the mirror with gentle use of an air-blower, and nothing else.

› Cleaning the sensor



SENSOR CLEANING

Cleaning the sensor requires confidence and great care!

Strictly speaking, it's not the sensor itself, but the low-pass filter in front of it that concerns us. Specks of dust on this filter will appear as dark spots in an image. Prevention is better than cure, so change lenses with care, sheltering the camera from any wind. In really bad conditions it's best not to change lenses at all.

Even so, unless you never change lenses, some dust will eventually find its way in. Fortunately, the Df has a self-cleaning facility, which vibrates the low-

pass filter to displace dust. This can be activated manually at any time or set to occur automatically when the camera is switched on and/or off; you can make your choice via the **Clean Image Sensor** option on the Setup menu.

Occasionally, however, stubborn dust may appear on the low-pass filter and it will become necessary to clean it by hand. You should do this in a clean, draught-free area with good light, preferably using a lamp that can be directed into the camera.

Make sure the battery is fully charged, or use a mains adapter. Remove the lens, switch the camera on, and select **Lock mirror up for cleaning** from the Setup menu. Press the shutter-release button to lock up the mirror.

Start by attempting to remove dust using a hand-blower (not compressed air or other aerosol). If this is ineffective, consider using a dedicated sensor-cleaning swab, but be sure to follow the instructions supplied with it. Do not use

other brushes or cloths and never touch the low-pass filter with your finger. When cleaning is complete, turn the camera off and the mirror will reset.

Tip

If (when!) spots appear on images, they can always be removed using software—the Clone tool or Healing brush in Adobe Photoshop, for example. In Nikon Capture NX2 this process can be automated by creating a Dust-off reference image (see page 125), while Adobe Lightroom allows spot removal to be applied across batches of images.

Warning!

Any damage caused by heavy-handed manual cleaning or the use of inappropriate products could invalidate your warranty. If in doubt, consult a professional dealer or camera repairer.

› Cold

Nikon specify an operating temperature range of 32–104°F (0–40°C). When the ambient temperature falls below freezing the camera can still be used, but aim to keep it within the specified range as far as possible. Keeping the camera in an insulated case or under outer layers of clothing between shots will help keep it warmer than the surroundings.

If it does become chilled, battery life can be severely reduced, so carry a spare. In extreme cold, the LCD displays may

become erratic or disappear completely and ultimately the camera may cease to function. If allowed to warm up gently, no permanent harm should result.

SNOW

Winter conditions offer wonderful photographic opportunities, but can be challenging for both the camera and the photographer.



› Heat and humidity

Extremes of heat and humidity (Nikon stipulates more than 85%) can be even more problematic than cold, since they are more likely to lead to long-term damage to the camera.

In particular, rapid transfers from cool environments to hot and humid ones (air-conditioned hotel to sultry streets, for example) can cause internal condensation. If such transitions may occur, pack the camera and lens(es) in airtight containers with sachets of silica gel, which will absorb

any moisture. Allow the equipment to reach the ambient temperature before unpacking it, let alone using it.

»

HEAT

Heat and humidity—especially in combination—can create many challenges.



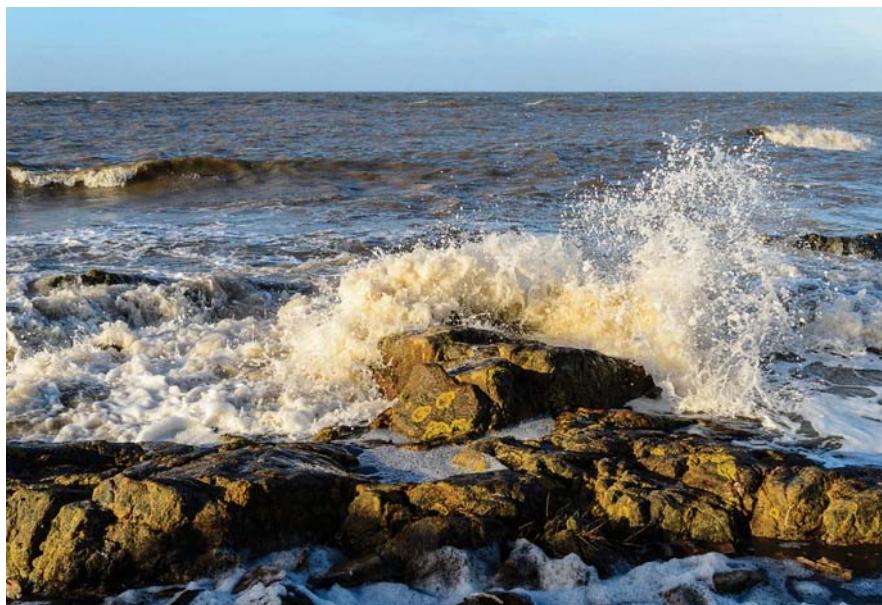
The Df is reasonably weatherproof, so it can be used with a certain amount of confidence in light rain. It is still a good idea to keep exposure to a necessary minimum, though, and to wipe the camera regularly with a microfiber cloth. Keep the hotshoe cover in place (this is easily lost or forgotten!) and double check that all other access covers on the camera are closed.

Take extra care to avoid contact with salt water. If this does occur, clean the camera carefully and immediately with a cloth lightly dampened with fresh water—preferably distilled water.

Ideally, protect the camera with a waterproof cover. A simple plastic bag will provide rudimentary protection, but purpose-made rain-guards are also available. True waterproof cases are generally very expensive.

SALT WATER

This was an attractive picture opportunity, but it was potentially hazardous for the camera: salt spray is notoriously insidious. Sand, dust, and dirt all require care too.



› Dust

To minimize the ingress of dust into the camera, take great care when changing lenses. Aim the camera slightly downward and stand with your back to any wind. In really bad conditions it's better to protect the camera with a waterproof (and therefore dust-proof) case.

Dust that settles on the outside of the camera is relatively easy to remove; the safest way is with a hand-operated or

compressed-air blower. Do this before changing lenses, memory cards, or batteries, keeping all covers closed until the camera is clean.

DUST



A biker on a dusty trail: this would not be a good moment to change lenses!



CONNECTION

This chapter, more than any of the others, would not exist in the world of the classic 35mm SLRs to which the Df pays homage. In digital photography, connecting to external devices—especially a computer—is not an optional step: it's how you store, organize, backup, and print images. The Df is designed to facilitate all of these operations, and a couple of useful cables are included with the camera.

» CONNECTING TO A COMPUTER

Connecting to a Mac or Windows PC allows you to store, organize, and backup your images. It also helps you exploit the full power of the Df, including the ability to optimize the image quality from Raw files. Some software packages allow “tethered”

shooting, where images appear on the computer straight after capture. Nikon Camera Control Pro 2 (an optional purchase) goes further, allowing the camera to be controlled directly from the computer.

› Computer requirements

Although the file sizes produced by the Df are smaller than most of its Nikon stablemates, they are still large enough to place significant demands on computer systems, stressing processor speed, hard drive capacity, and—above all—memory (RAM). Systems with less than 4GB of RAM may run slowly when dealing with Raw, TIFF, and full-size JPEG images from the camera. Fortunately, adding extra RAM to most computer systems is relatively easy and inexpensive. Extra hard drive space



CONNECTION PORTS ON THE LEFT
SIDE OF THE DF

«

can also be helpful, as the system will slow significantly when the hard drive becomes close to capacity.

A CD drive is useful for installing the supplied Nikon View NX2 software, but it is not essential as the software can also be downloaded from Nikon's web site. Nikon View NX2 requires one of the following operating systems: Mac OS X (Version 10.9, 10.8.5, or 10.7.5); Windows 8.1; Windows 7 (Service Pack 1); Windows Vista (Service Pack 2); Windows XP (Service Pack 3).

A DF CONNECTED TO A COMPUTER



APPLE'S TIME MACHINE



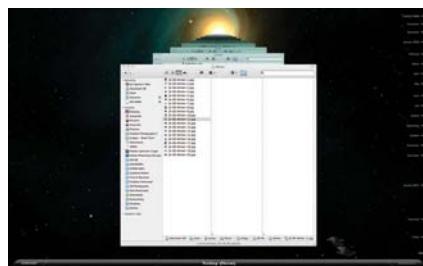
Time Machine maintains backups automatically.

» Backing up

Until they are backed up, your images exist solely as data on the camera's memory card. Memory cards are robust, but they are not indestructible. In any case, you will surely wish to format and reuse them.

However, when you transfer your images to the computer and the card is formatted, those images once more exist in a single location: the computer's hard drive. If anything happens to that hard drive—fire, theft, or hardware failure perhaps—you could lose thousands of irreplaceable images.

The simplest form of backup is to copy your images to a second hard drive, while the "gold standard" requires multiple drives, one of which is always kept off site. Online backup is also an option, but unless you shoot very sparingly you'll find that free services do not offer enough space, while paid services can easily cost more than a couple of spare hard drives.



› Connecting the camera

The supplied USB cable allows direct connection to a computer. The following description is based on Nikon Transfer, part of the supplied View NX2 package. The procedure with other software will be similar in outline, but different in detail.

- 1)** Open the cover on the left side of the camera and insert the smaller end of the supplied USB cable into the AV/USB slot; insert the other end into a USB port on the computer. Note that this should not be an unpowered hub or port on the keyboard.
- 2)** Switch the camera **ON**. Nikon Transfer will start automatically (unless you have configured its Preferences not to do so).
- 3)** The Nikon Transfer window offers various options. To transfer selected images only, use the check box below each thumbnail to select/deselect pictures as required.
- 4)** Click the **Primary Destination** tab to choose where your photos will be stored. You can create a new subfolder for each transfer, rename images as they are transferred, and so on.
- 5)** If you want Nikon Transfer to create backup copies automatically during transfer, click the **Backup Destination** tab.

- 6)** When the transfer is complete, switch the camera **OFF** and remove the USB cable.

NIKON TRANSFER



Tip

*Most people find it more convenient to transfer photos by inserting the memory card into a card reader or SD card slot built in to their computer (the procedure is broadly the same). If you transfer images using a card reader, remove the card from the system like any other external drive when the download is finished. In Windows, use **Safely Remove Hardware**; in Mac OS X use **Command + E** or drag the Df icon to the Trash. Note that older card readers may not support SDHC or SDXC cards.*

› Wireless connection

Nikon's Wireless Mobile Adapter (WU-1a) allows the Df to connect wirelessly to a suitable smartphone or tablet (iOS or Android). This will undoubtedly be welcome for many users, but it has to be said that its capabilities are limited.

First of all, it will only connect to mobile devices, not to a laptop or desktop computer. Secondly, the level of control over the camera is fairly rudimentary—you can set focus and trigger the shutter, but can't change any other settings.

Nikon's other wireless adapters provide you with greater control over the camera functions, but they still don't allow you to see what the camera sees. For that, the best solution appears to be the CamRanger wireless camera control, which provides Live View and control of all the main camera settings, and can link to iOS and Android devices as well as Mac and Windows computers. It may cost five times as much as Nikon's WU-1a, but it also provides much greater functionality.

If you just want to transfer images to a computer over a wireless network, the obvious low-cost option is to use an Eye-Fi card. However, image transfer can be fairly slow. If you're shooting Raw, TIFF, or even JPEG Large, the card may not be able to keep up.

› Eye-Fi



Eye-Fi looks and operates like a regular SD memory card, but it includes an antenna that allows it to connect to Wi-Fi networks, allowing you to transfer images wirelessly. Some Eye-Fi cards also support ad-hoc networks, allowing images to be transferred to a laptop or iPad when out of the range of regular Wi-Fi. For leisurely-paced work such as landscapes, this can be a good way of backing up while out in the field, but it won't work for prolific sports shooters.

Eye-Fi software is installed by plugging the card into any Wi-Fi-enabled computer, and that computer then becomes the default destination for Eye-Fi upload. The card can then be inserted in the camera: select **Eye-Fi Upload** from the Setup menu to enable transfers. When out of range of your network, turn Eye-Fi off to save battery power. The card still functions as a regular memory card.

» SOFTWARE AND IMAGE PROCESSING

The Df is bundled with Nikon View NX2 software, which includes Nikon Transfer. View NX2 covers most of the main processes: you can view and browse images, save them to other formats, and print them out. However, editing and enhancing images (including Raw files) is not very intuitive, especially when compared to iPhoto or Lightroom. The results can be just as good, but achieving them might try your patience. View NX2 is also weak for organizing and cataloging your images.

› Connecting the camera



NIKON VIEW NX2



1) From any browser view, click on an image to highlight it. **Image Viewer** shows the image larger, with a histogram, and there's also a **Full Screen** view.

2) The **Metadata** tab gives detailed info about the image and the **Adjustment**

palette allows adjustments to be made, such as exposure and white balance.

3) Close the image and you will be asked if you want to save any adjustments. You do not need to export the file immediately.

4) Choose **Convert Files** from the **File** menu to export the file as a TIFF or JPEG that can be viewed, edited, and printed by other applications. You can resize and rename the image if you wish.

› Nikon Capture NX2



NIKON CAPTURE NX2



For a wider range of editing options, especially in relation to Raw files, Nikon Capture NX2 (an optional purchase) or one of its third-party rivals is essential. Unlike programs such as Adobe Lightroom and Photoshop, Capture NX2 cannot open Raw files from non-Nikon cameras. Capture NX2 also has a quirky interface;

some love it, others just can't get on with it. In any case, you will need another app for cataloging your images.

› Camera Control Pro 2

Camera Control Pro 2—a professional product at a professional price—allows you to control the Df directly from your computer (“tethered shooting”). As images are captured you can check them in detail on your computer screen, while Live View integration allows real-time viewing. This requires a physical (wired) connection.

› Third-party software

The undisputed market leader when it comes to image-editing software is Adobe Photoshop. Its power is enormous—far beyond most users’ needs. Adobe has recently changed to a subscription model under the “Creative Cloud” label, which means that the software is regularly updated (and version numbers don’t mean very much any more), but it will stop working if you don’t keep up the subscription payments.

Many users, including some pros, find they can get all they need from the far more affordable Photoshop Elements, which still has sophisticated editing features, including the ability to open



ADOBEPHOTOSHOP CC



LIGHTROOM'S LIBRARY MODULE



LIGHTROOM'S DEVELOP MODULE

Adobe Lightroom’s Develop module offers a very wide range of Raw adjustment tools.

Raw files from the Df. It is currently still obtainable on the more familiar model where you pay once for a perpetual license to use the software. Photoshop Elements

also benefits from an Organizer module, which allows you to “tag” photos, assign them to “Albums,” or add keywords.

Mac users have another ready choice in the form of iPhoto, which is pre-installed on new Macs. Like Photoshop Elements, it combines organizing and editing abilities, and can open Raw files from the Df. However, unlike Photoshop Elements it cannot edit in 16-bit depth, which is recommended for the best results.

Finally, there are two one-stop solutions in the shape of Apple’s Aperture (Mac only) and Adobe Lightroom (Windows/Mac). These programs are recommended if you regularly shoot Raw and both offer powerful organizing and cataloging functions that integrate seamlessly with advanced image editing. Another advantage is that any editing you perform is “non-destructive.” This means the edit settings (changes you make to your image

Note:

Older versions of Photoshop, Elements, Lightroom, and other software may not recognize Raw files created by the Df. One workaround is to use Adobe’s free DNG Converter program, which will convert the Df’s NEF Raw files into the widely compatible DNG Raw format. However, this adds a time-consuming step to your workflow: upgrading your software may be an easier option.

such as color and exposure adjustments, cropping, and so on) are recorded alongside the original Raw file. TIFF or JPEG versions that incorporate these edits can be exported as and when needed.

Recent versions of Aperture and Lightroom support tethered shooting, as do several other apps: Mac users have a fine free option in the shape of Sofortbild.

› Color calibration

Regardless of the software that you choose to use, a major headache for digital camera users is that images can appear one way on the camera’s LCD, different on the computer screen, different when you email them to your friends, and different again when printed. To achieve consistency across different devices it is vital that your main computer screen is correctly set up and calibrated. This may seem complex and time-consuming, but it will ultimately save a lot of time and frustration. Detailed advice is beyond the scope of this book, but try searching your computer’s System Help for “monitor calibration.” There’s more detail in the *Digital SLR Handbook* (from this author and publisher).

» GPS

Nikon's GP-1 or GP-1a GPS (Global Positioning System) units can be mounted on the Df's hotshoe or clipped to the camera strap. They link to the camera's accessory terminal using a supplied cable and this allows information on latitude, longitude, altitude, heading, and time to be added to the image metadata. This is displayed as an extra page of information on playback and can be read by many imaging apps.

When the camera has established a connection and is receiving data from the GPS, **GPS** will be displayed in the Information Display. If this flashes, the GPS is searching for a signal and data will not be recorded.

The **Location data** option in the Setup menu has three sections:

Standby timer

If set to **Off (Disable)**, this stops the meters turning off and returning the camera to

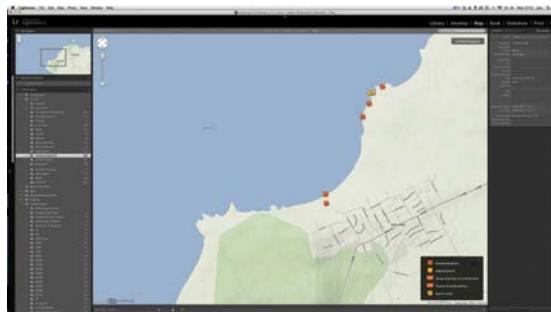
standby mode. This ensures that the GPS receiver is always able to connect to the satellite network, unless the signal is blocked. If you select **On (Enable)**, the meters will turn off after 1 minute. This saves battery power, but the next time you take a picture the GPS receiver may not have time to get a fix, in which case no location data will be recorded.

Position

Displays your current position as reported by the GPS device. Apart from other uses, this could be handy if you get lost!

Set clock from satellite

As the GPS network embodies some of the most accurate timing in existence, enabling this should mean that your camera's clock is always correct.



LOCATION

Shooting locations shown in Lightroom's Map module.



» CONNECTING TO A PRINTER



The camera's memory card can be inserted into a compatible printer or taken to a high street photo outlet. Alternatively, the camera can be connected to any printer that supports the PictBridge standard. If you want prints from Raw files you will need to create JPEG copies first. You can't print TIFF files directly either.

For maximum flexibility and power when printing, transfer your photographs to a computer first.

CONNECTING TO A PRINTER



Option	Options available	Notes
Page size		Options depend on the paper sizes the printer can support.
No. of copies	1-99	Use \blacktriangle / \blacktriangledown to choose the number of copies and press OK to select.
Border	Printer default Print with border No border	If Print with border is selected, borders will be white.
Time stamp	Printer default Print time stamp No time stamp	Prints the time and date when the image was taken.
Crop	Crop No cropping	Crop prints selected area only to size selected under Page size . Screen shows image with border delineating crop area. Use \square and \blacktriangle to change the size of this area and use the multi-selector to reposition it. When satisfied, press OK .

To connect to a printer

1) Turn the camera **OFF**.

2) Turn the printer on and connect the supplied USB cable. Insert the smaller end of the cable into the USB slot, under the cover on the left side of the camera.

3) Turn the camera **ON**. You should now see a welcome screen, followed by a PictBridge playback display. There's now a choice between **Printing pictures one at a time** or **Printing multiple pictures**.

Printing pictures one at a time

1) Select the photo you wish to print and then press **OK**. This reveals a menu of

printing options (see page opposite). Use the multi-selector to navigate the menu and highlight specific options; press **OK** to make a selection.

2) When the required options have been set, select **Start printing** and press **OK**. To cancel at any time, press **OK** again.

Printing multiple pictures

You can print several pictures at once. You can also create an index print of all JPEG images (up to a maximum of 256) currently stored on the memory card (Raw images cannot be printed).

With the PictBridge menu displayed, press **OK**. The options below are displayed:

Print select	Use the multi-selector to scroll through pictures on the memory card. To choose the currently selected image for printing press ▲ . The picture is marked and number of prints set to 1. Press ▲ repeatedly to print more copies. Repeat this process to select further images and choose the number of prints for each. Press OK to display the PictBridge menu and select printing options, as you would if printing a single image. Select Start printing and press OK .
Select date	Print one copy of each picture taken on selected date(s).
Print (DPOF)	Prints images already selected using Print set (DPOF) option in the Playback menu.
Index print	Prints all JPEG images on the memory card, up to maximum of 256. If more images exist, only the first 256 will be printed.

» CONNECTING TO A TV

You can view photos and slideshows through an HDMI (High Definition Multimedia Interface) television or set-top box. The Nikon Df does not support non-HDMI systems.

- 1)** Check the settings of the **HDMI** option in the Setup menu.
- 2)** Turn the camera **OFF** (you should always do this before connecting or disconnecting the cable).
- 3)** Open the HDMI cover halfway down the left side of the camera and insert the cable into the slot. Connect the other end to the TV.
- 4)** Tune the TV into an HDMI channel.

5) Turn the camera **ON** and press the playback button. Images remain visible on the camera monitor as well as on the TV. Navigate using the multi-selector in the usual way. The Df's **Slide show** setting can be used to automate playback.

Note:

It is recommended that you use a mains adapter for lengthy playback sessions. No harm should result if the camera's battery expires during playback, but it is annoying.

» POST-PROCESSING

Superficially, this might appear to be a “dull” day, but the sky was very much brighter than the landscape. The Df did well to retain such good detail in highlights and shadows, but this image still required careful post-processing.



Settings

- › Focal length: 14mm
- › ISO: 100
- › Shutter speed: 1/30 sec.
- › Aperture: f/16

» GLOSSARY

8-bit, 12-bit, 16-bit see Bit depth.

Aperture The lens opening that admits light. Relative aperture sizes are expressed in f-numbers (see f-number).

Artifact Occurs when data is interpreted incorrectly, resulting in visible flaws in the image.

Bit depth The amount of information recorded for each color channel. 8-bit, for example, means that the data distinguishes 28 (256) levels of brightness for each channel. 16-bit images recognize over 65,000 levels per channel, which allows greater freedom in editing. The Df records Raw images in 12- or 14-bit depth; they are converted to 16-bit when they are imported to the computer.

Bracketing Taking a number of otherwise identical shots in which just one parameter (such as exposure) is varied.

Buffer On-board memory that holds images until they can be written to the memory card.

Burst A number of frames shot in quick succession. The maximum burst size is limited by buffer capacity.

Channel The Df, like other digital cameras, records data for three separate color channels (see RGB).

Chimping Checking images on the screen after shooting.

Clipping Complete loss of detail in highlight or shadow areas of the image

(sometimes both!), leaving them as blank white or solid black.

CMOS Complementary Metal Oxide Semiconductor; a type of image sensor used in many digital cameras.

Color temperature The color of light, expressed in degrees Kelvin (K). Confusingly, “cool” (bluer) light has a higher color temperature than “warm” (red) light.

CPU Central Processing Unit; a small computer in the camera (also found in many lenses) that controls most or all of the unit’s functions.

Crop factor see Focal length multiplication factor.

Diopter Unit expressing the power of a lens.

dpi (dots per inch) A measure of resolution: should be applied only to printers (see ppi).

Dynamic range The range of brightness from shadows to highlights within which the camera can record detail.

Exposure Used in several senses. For instance, “an exposure” is virtually synonymous with “an image” or “a photo.” Also refers to the amount of light hitting the image sensor and to systems of measuring this. See Overexposure and Underexposure.

EV Exposure Value; a standardized unit of exposure. 1EV is equivalent to 1 “stop” in traditional photographic parlance.

Extension rings/tubes Hollow tubes that fit between the camera body and lens, providing greater magnification.

f-number Lens aperture expressed as a fraction of focal length: f/2 is a wide aperture and f/16 is narrow.

Fast (lens) Lens with a wide maximum aperture, such as f/1.8. For long telephotos f/4 is relatively fast.

Fill-in flash Flash used with daylight. Prevents dark shadows with naturally backlit or harshly side-lit subjects.

Filter A piece of glass or plastic placed in front of, within, or behind the lens to modify the light.

Firmware Software that controls the camera: upgrades are issued by Nikon from time to time and can be transferred to the camera via a memory card.

Focal length The distance (in mm) from the optical center of a lens to the point at which light is focused.

Focal length multiplication factor In DX crop mode the image area is smaller than a 35mm film frame so the effective focal length of all lenses is multiplied by 1.5.

fps (frames per second) The number of exposures (photographs) that can be taken in one second. The Df's maximum rate is 5.5fps.

Highlights The brightest areas of the scene and/or image.

Histogram A graph representing the distribution of tones in an image, ranging from pure black to pure white.

Incident light metering Measuring the light falling onto a subject, usually with a separate meter. An alternative to the in-camera meter, which measures reflected light.

ISO International Standards Organization. ISO ratings express film speed; the sensitivity of digital sensors is quoted as ISO-equivalent.

JPEG A compressed image file standard, from the Joint Photographic Experts Group. High levels of JPEG compression can reduce files to about 5% of their original size, but there may be some loss of quality.

LCD Liquid Crystal Display; flat screen like the Df's rear monitor.

Macro A term used to describe close focusing and the close-focusing ability of a lens. A true macro lens has a reproduction ratio of 1:1 or better.

Megapixel see Pixel.

Memory card A removable storage device for digital cameras.

Noise Image interference manifested as random variations in pixel brightness and/or color.

Overexposure When too much light reaches the sensor, resulting in an image that is too bright.

Pixel Picture element; the individual colored dots (usually square) that make up a digital image. One million pixels = 1 megapixel.

ppi (pixels per inch) Should be applied to digital files rather than the commonly used dpi.

Reproduction ratio The ratio between the real size of an object and the size of its image on the sensor.

Resolution The number of pixels for a given dimension, for example 300 pixels per inch. Resolution is often confused with image size. The native size of an image from the Df is 4928 x 3280 pixels; this could make a large, but coarse print at 100 dpi or a smaller, but finer, print at 300 dpi.

RGB Red, Green, Blue. Digital devices, including the Df, record color in terms of brightness levels of the three primary colors.

Sensor The light-sensitive, image-forming chip at the heart of every digital camera.

Shutter The mechanism that controls the amount of light reaching the sensor by opening and closing to expose the sensor when the shutter-release button is pushed.

Speedlight Nikon's range of dedicated external flash units.

Spot metering A metering system that takes its reading from the light reflected by a small portion of the scene.

Telephoto lens A lens with a large focal length and a narrow angle of view.

TIFF (Tagged Image File Format) A universal file format supported by virtually all image-editing applications.

TTL Through The Lens, like the viewing and metering of SLR cameras such as the Df.

Underexposure When insufficient light reaches the sensor, resulting in an image that is too dark, often accompanied by clipped shadows.

USB (Universal Serial Bus) A data transfer standard, used to connect to a computer.

Viewfinder An optical system used for framing the image; on an SLR camera like the Df it shows the view as seen through the lens.

White balance A function that compensates for different color temperatures so that images may be recorded with correct color balance.

Wide-angle lens A lens with a short focal length and a wide angle of view.

Zoom A lens with variable focal length, giving a range of viewing angles. To zoom in is to change focal length to give a narrower view; to zoom out is the converse. Optical zoom refers to the genuine zoom ability of a lens; digital zoom is the cropping of part of an image to produce an illusion of the same effect.

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» INDEX

A

AC adapter 211
accessories 206–215
Active D-Lighting 90, 91, 94, 107, 122
Adobe RGB color space 77
AE/AF lock 121
AF

activation 112
-area modes 65
fine-tune 129
points 171

AF-C priority selection 112

AF-D lens 47

AF-S

lens 47
priority selection 112

analog exposure displays 51

Aperture Priority (A) mode 6, 12, 35,
39, 40, 46, 47

aperture

in Live View 85
selection 47

significance of 47

aspect ratio 132

Assign

AE-L/AE-L button 120

Fn. button 120, 121

preview button 120

remote Fn. button 129

atmospheric perspective 189

Auto

-area AF mode 66

bracketing (Mode M) 118

distortion control 107

FP high speed sync 146

image rotation 126

ISO

options 59

sensitivity control 26, 59, 122

mode 26

Automatic exposure bracketing 12

A/V connector 13

B

backing up 214, 223

barrel distortion 192

battery 210

charging 32, 210

inserting 31

life 32

beanbag 213

bellows 177

bodycap 29, 210

bounce flash 160

bracketing burst 121

Bracketing order 118

buffer 12, 38

Bulb mode 50

C

cable release 211

Calendar view 87

camera

basic operation 33–38

care 216–221

hybrid 26

layout 14–17

preparation 28–32

shake 43

support 213

Camera Control Pro 2 227

Camera Raw 69

CCD sensor 10

Center-weighted area 113

center-weighted metering 12, 52, 121

chromatic aberration 192

cleaning the sensor 216

close-up 170–181

CLS-compatible Speedlights 146

CMOS sensor 10

cold conditions 218

color 73–77

balance 134

calibration 228

space 77, 107

temperature 77

Color

outline 137

sketch 137

command dial/s 26, 35, 36

composition 142, 143

connecting

to a computer 222–223

to a printer 230–231

to a TV 232

connectors (A/V, HDMI, mic, USB) 13

Continuous

drive mode 12

High speed 37, 38

Low speed 37

-servo AF (AF-C) 64

control panel, LCD 33, 34

controls

main rear 34

pre-shoot 91

top-plane 33

Copyright information 126

crop factor 186, 187, 195

cropping images 132

Customize command dials 120

Custom Setting menu 23, 111–123

D

default settings 78

deleting images 87

depth of field 48, 49, 170

dial

Command 26, 35, 36

exposure

compensation 54

mode 39

ISO 58

release mode 37

shutter speed 41

sub-command 27, 35, 36, 47

top-plate 26

diopter adjustment 29, 212

distortion 137, 192

D-Lighting 90, 94, 131

DPOF print order 102

drive modes 12

D-type lenses 66

dust, effects of 221

DX

crop 71

format sensor 8

lenses 71, 186, 187

Dynamic area AF mode 66

dynamic range 97

E

Easy shutter speed shift 123

electronic rangefinder 65

elements, braving the 218–221

exposure 96

bracketing 12, 55, 56

compensation 12, 13, 54–57

lock 57

mode dial 39

preview 81

modes 12, 39–43, 150

extension tubes 176

Eye-Fi upload 130

F

Face priority mode 84

field of view 187

file

naming 105

types, still image 12

fill-in flash 148–149

filters 206–209

neutral density 208

polarizing 207

special effects 209

UV and skylight 206

firmware version 130

fisheye effect 138

flare 191

flash 144–169, 13

accessories 167

bounce 160

compensation 156

cord 175

diffuser 175

exposure 150–158

bracketing 158

compensation 13

fill-in 148–149

high speed sync 160

manual 157

- modes 13, 154, 155
off-camera 160–161
principles 145
range 152
shutter speed 117
synchronization 154
sync speed 117
 wireless 162
flashes, third-party 147
Flash off 121
flexible program 40
Flicker reduction 125
f-mount system 6, 182
focal length 186–188
focus 12
 mode 64
 points 66, 67
 zoom 84
Focus
 point illumination 112
 point wrap-around 113
 tracking with lock-on 112
focusing 64–68
 in Live View 82
 screen 29
Format memory card 124
fps (frames per second) 11, 38
freezing motion 42, 44
front curtain sync 154
FV (flash value) 146
FV lock 121, 157
FX format 8, 10, 186
- G**
GPS units 212, 229
G-type lenses 26, 47, 66, 137, 148
guide number (GN) 154
- H**
HDMI 127
 connector 13
HDR (high dynamic range) images 94–95, 108, 122
heat and humidity, effects of 219
High ISO NR 108
highlights display 88, 89
high speed flash sync 160
histogram displays 88
hotshoe 13
- I**
image
 area and size 71–72, 105
 enhancement 90–95
 playback 85–89
 quality 69–70, 105
 resize 136
 size 72, 105
Image
 comment 126
Dust Off ref photo 125
- overlay 134
Quality, setting 26
Review 85, 101
 straighten 136
images
 cropping 132
 deleting 87, 99
 HDR 94–95
 hiding 100
 protecting 88
 viewing as thumbnails 87
Information Display 20–21, 34, 50, 51, 54, 116
interval timer shooting 110
ISO 58–63
 Auto, sensitivity control 59
 base 61, 63
 choices 60
 dial 58
 display 115
 equivalent settings 152
 low 63
 range 12
 rating 10, 11
 high 10, 62
 sensitivity control 26
 setting, changing the 26, 59
 standard 10
- i-TTL
 balanced fill-flash 148
 flash metering 146
 flash, standard 149
- J**
JPEG
 files 12, 38, 69, 91, 137
 compression 12, 105
- L**
Language 125
LCD
 control panel 19, 33
 illumination 116
 monitor/screen 11, 12
LED light 174
- lenses** 182–205
 Ai/non-Ai 190
 close-up attachment 176
 D-type 66, 137, 148
 DX, using 71, 186, 187
 FX format 186
 G-type 26, 47, 137, 148
 macro 178–179, 197
 perspective control 198
 standard 194
 telephoto 196
 wide-angle 189, 195
 zoom 192, 197
- lens**
 AF-D, AF-S 47
 care 193
- charts, Nikkor 200–205
flare 191
hood 173, 210
issues 191–193
mounting a 29
non-CPU 190
technology 184–185
 types 190, 194–199
- lighting, macro 174–175
Live View 79–84, 119
 AF modes 82
 AF-area mode 83
 and macro photography 171
 aperture in 85
 changing settings in 80
 exposure preview 81
 focusing in 82
 Quick settings 81
- Location data 130
Lock mirror up for cleaning 124
- M**
macro
 lighting 174–175
 lenses 178–179, 197
 photography 171, 172–173
 equipment 176–177
- Manual**
 focus (M) 65, 84
 (M) mode 12, 35, 39, 50, 51
matrix metering 12, 52, 121
Max continuous release 116
memory cards 13, 30, 31, 214
menu
 Custom Setting 23, 111–123
 displays 22–25
 My Menu/Recent Settings 25, 139–141
 Playback 22, 99–102
 Retouch 24, 130–139
 Setup 24, 124–130
 Shooting 22, 26, 103–110
menus 98–143
 navigating the 98
- metering**
 center-weighted 52
 coupling lever 190
 matrix (3D color) 52
 modes 52–53
 patterns 12
 spot 12, 53, 121, 149
- microphone connector 13
Minature effect 139
Mirror-up 37
- mode**
 Aperture Priority (A) 12, 39, 46
 Auto 26
 Auto-area AF 66
 Bulb 50
 Dynamic-area AF 66
 Face priority 84

- focus 64
 Manual (M) 12, 35, 39, 50, 51
 playback 119
 Program (P) 7, 12, 35, 39, 40
 Quiet 37
 release 37
 Scene 26
 shooting 119
 Shutter Priority (S) 7, 35, 39, 41, 42
 Single-area AF 66
 Subject tracking 84
 Modeling flash 118
 modes
 drive 12
 exposure 12, 39–43
 flash 13
 metering 52–53
 monitor brightness 81, 124
 monopods 213
 motion, freezing 42, 44
 Multi-CAM 4800 module 11, 12
 multiple exposure 109, 122
 multi-selector 36, 85, 120
 My Menu/Recent Settings menu 25, 122, 139–141
- N**
 NEF (RAW) files 69
 processing 135
 recording 103, 106, 121
 neutral density filters 208
 Nikon
 Capture NX2 226
 Creative Lighting System 146–147
 D1, D3, D4 8, 9
 F3, FM2 6, 7, 9
 noise 60, 108
 Non-CPU lens data 52, 129
- O**
 off-camera flash 160–161
 optical perspective 189
 Optional flash 117
 overexposure 96
- P**
 panning 45
 perspective 189
 atmospheric 189
 control lenses 198
 optical 189
 wide-angle 189
 Perspective control 139
 photo information, viewing 85
 Picture Controls 26, 92–93
 pixel (photosite) 10
 playback
 display options 101
 folder 100
 mode 119
 Playback 122
- menu 22, 99–102
 zoom 86
 polarizing filters 207
 post-processing 233
 pre-shoot controls 91
 printer, connecting to a 230–231
 Programmed auto with flexible (P)
 exposure mode 7, 12, 40
 Program (P) mode 35, 39, 40
 program shift 40
 protecting images 88
 Pure Photography 11, 65
- Q**
 Quick
 retouch 135
 Settings 34, 81
 Quiet mode 37
- R**
 rangefinder, electronic 65
 Raw
 files 12, 69, 73, 135
 rear curtain sync 155
 Recent settings 140
 red-eye 134
 reduction 155
 with slow sync 156
 reflector 175
 release mode 37
 remote cords 211
 reproduction ratio 172
 Retouch menu 24, 130–139
 Reverse indicators 123
 reversing rings 177
 ringflash 173
 Rotate tall 101
- S**
 Save/load settings 127
 Scene mode 26
 screen, LCD 11
 Secure Digital memory cards 13
 Selective color 138
 Self-timer 37, 114
 drive mode 12
 sensor 11, 12
 CCD, CMOS 10
 cleaning the 216
 DX, FX format 8, 10
 Setup menu 24, 124–130
 Shooting menu 22, 26, 76, 103–110
 shooting mode 119
 Shutter Priority mode 7, 35, 39, 40,
 41, 42
 shutter
 operating the 33
 RELEASE button 33
 speed 150, 151
 dial 41
 speeds 12, 42, 43
- Shutter-release button AE-L 114
 Single-area AF mode 66
 Single drive mode 12
 single frame (S) 37
 Single-servo AF (AF-S) 64
 Slide show 102
 Slot empty release lock 123
 slow sync 154
 snow, effects of 218
 software and image processing 13,
 226–228
 special effects filters 209
 Speedlights 13, 146, 159, 164–166
 spot metering 12, 53, 121, 149
 sRGB color space 77
 standard lenses 194
 Standby timer 114
 storage 104, 214, 215
 strap, attaching the 28
 sub-command dial 26, 47, 76
 Subject tracking mode 84
 sync speed 13
- T**
 teleconverters 199
 telephoto lenses 196
 temperature 218
 TIFF files 12, 69, 91, 137
 Time zone and date 125
 top-plate controls 26, 33
 tripods 213
 TV, connecting to a 232
 two-button reset 78
- U**
 underexposure 96
 USB connector 13
 UV and skylight filters 206
- V**
 viewfinder 12, 34, 66
 display 18
 grid display 115, 121
 virtual 122
 vignetting 107, 193
 virtual horizon indicator 80, 127
- W**
 water, effects of 220
 weatherproofing 220
 white balance 73, 74, 75, 76, 77, 107
 wide-angle lens 189, 195
 wireless
 connection 225
 flash 162
 mobile adapter 129, 211, 225
 remote controller 211
 working distance 173
- Z**
 zoom lenses 192, 197